REPORT CRPL-1-2, 3-1, A ISSUED NOVEMBER 1, 1948

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
WASHINGTON, D. C.

# SUPPLEMENT TO REPORT
# CRPL-1-2, 3-1

Report No.
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Contents:

1. Tables I-VI. Azimuth and distance of the subsolar point for stations at various latitudes.

2. Tables VII-XII. Local time and azimuth of the subsolar point for stations at various latitudes.

3. Revisions of Figures 3,4,9,10,15,16,21 and 22, CRPL-1-2, 3-1.

## Description and use of tables

The charts of Figures 1-108 of report CRPL-1-2, 3-1 give field intensity contours for transmitting stations at specified distances from the subsolar point, plotted for azimuths relative to that of the subsolar point. To use these charts, the distance of the subsolar point from the transmitting station must be known, as well as the azimuth of the transmission path between the transmitting station and the point at which it is desired to know the field intensity.

Tables I through VI* give the azimuth and distance of the subsolar point for each hour of the day (apparent solar time at the transmitting station) for stations located at each $10^{\circ}$ of latitude on the earth's surface, and solar declinations of $+23^{\circ}$, $0^{\circ}$, and $-23^{\circ}$.

Tables VII-XII present a somewhat more useful form of the information in tables I-VI. In tables VII-XII the local time "t" and the azimuth "a" of the subsolar point are tabulated for particular distances of the subsolar point corresponding to those represented in the charts of report CRPL-1-2, 3-1.

Tables VII-XII are in the nature of a guide for use in rapidly plotting field intensity as a function of time of day for a given transmission path. Given the latitude of the transmitting station and the azimuth of the path at that station, in degrees clockwise from north, the following procedure may be followed to determine the field intensity, relative to 1 kw radiated on an omnidirectional antenna.

*Tables I-VI are the same as those issued previously as a supplement to report CRPL-1-2, 3-1.

1. For the desired solar declination, select the latitude nearest that of the transmitter.

2. Using a form similar to that in the example below, write in:

   Column 1, the distance to the subsolar point.
   Column 2, the local times t, both forenoon and afternoon.
   Column 3, the azimuths of the subsolar point a, both forenoon and afternoon.

3. In Column 4, enter the difference between the azimuth of the path and that of the subsolar point, without regard to sign.

4. Using the data of columns 1 and 4, and for the desired frequency, determine the field intensity for each local time from the appropriate chart of Figs. 1-108 of report CRPL 1-2, 3-1.

5. To obtain field intensities at other local times, plot the values found in step 4 as a function of local time, draw a smooth curve through the points, and read field intensity for desired local times from the curve.

Example. Latitude of station 39°N; azimuth of path 40°; frequency = 10 Mc. Solar declination + 23° (northern hemisphere summer); distance = 6000 km; sunspot minimum. The data for 40°N will be used, from Table IX.

| 1<br>Distance to Subsolar point (Km) | 2<br>Local Time t | 3<br>Azimuth (deg.) a | 4<br>Difference in Azimuths (deg.) | 5<br>Field Intensity (uv/m) | 6<br>Chart Used |
|---|---|---|---|---|---|
| 12500 | 01.7 | 25 | 15 | 9.0 | Fig. 64 |
| 10000 | 04.7 | 59 | 19 | 3.0 | Fig. 52 |
| 7500 | 06.7 | 78 | 38 | 1.3 | Fig. 40 |
| 5000 | 08.7 | 97 | 57 | 0.7 | Fig. 28 |
| 2500 | 10.9 | 134 | 94 | 0.8 | Fig. 16 (revised) |
| 2500 | 13.1 | 226 | 186 | 1.5 | Fig. 16 (revised) |
| 5000 | 15.3 | 263 | 223 | 3.0 | Fig. 28 |
| 7500 | 17.3 | 282 | 242 | 13.0 | Fig. 40 |
| 10000 | 19.3 | 301 | 261 | 16.0 | Fig. 52 |
| 12500 | 22.3 | 335 | 295 | 18.0 | Fig. 64 |

It should be noted that, although the field intensity charts, Figures 1-108, of CRPL-1-2, 3-1 are nominally to be regarded as if the transmitting station were located at the center, because of the reciprocity relationship, the field intensity is the same if the locations of receiving and transmitting stations are interchanged. Thus the above procedure also gives the field intensity if all azimuths, distances, times, and the latitude are referred to the receiving location.

Revisions of Figures 3,4,9,10,15,16,21 and 22.

The attached field intensity charts, labeled Figures 3,4,9,10,15,16,21 and 22 (revised), replace the charts of the same figure numbers in report CRPL-1-2, 3-1.

Station local Time

| Station Latitude | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 |
| 80 | 0 | 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 | 165 |
| | 11110 | 11070 | 10960 | 10780 | 10550 | 10290 | 10000 | 9710 | 9450 | 9220 | 9040 | 8930 |
| 70 | 0 | 16 | 32 | 47 | 61 | 76 | 90 | 104 | 119 | 133 | 148 | 164 |
| | 12220 | 12140 | 11930 | 11560 | 11090 | 10560 | 10000 | 9440 | 8910 | 8440 | 8090 | 7860 |
| 60 | 0 | 17 | 34 | 49 | 63 | 77 | 90 | 103 | 117 | 131 | 146 | 163 |
| | 13330 | 13210 | 12850 | 12300 | 11610 | 10830 | 10000 | 9170 | 8390 | 7700 | 7150 | 6790 |
| 50 | 0 | 19 | 37 | 52 | 66 | 78 | 90 | 102 | 114 | 128 | 143 | 161 |
| | 14440 | 14260 | 13760 | 13000 | 12080 | 11060 | 10000 | 8940 | 7920 | 7000 | 6240 | 5740 |
| 40 | 0 | 23 | 42 | 57 | 70 | 80 | 90 | 100 | 110 | 123 | 138 | 157 |
| | 15560 | 15300 | 14620 | 13640 | 12500 | 11270 | 10000 | 8730 | 7500 | 6360 | 5380 | 4700 |
| 30 | 0 | 28 | 49 | 63 | 74 | 82 | 90 | 98 | 106 | 117 | 131 | 152 |
| | 16670 | 16310 | 15400 | 14200 | 12850 | 11440 | 10000 | 8560 | 7150 | 5800 | 4600 | 3690 |
| 20 | 0 | 38 | 59 | 71 | 79 | 85 | 90 | 95 | 101 | 109 | 121 | 142 |
| | 17780 | 17240 | 16050 | 14630 | 13110 | 11560 | 10000 | 8440 | 6890 | 5370 | 3950 | 2760 |
| 10 | 0 | 57 | 73 | 80 | 84 | 87 | 90 | 93 | 96 | 100 | 107 | 123 |
| | 18890 | 18000 | 16500 | 14900 | 13280 | 11640 | 10000 | 8360 | 6720 | 5100 | 3500 | 2000 |
| 0 | - | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| | 20000 | 18330 | 16670 | 15000 | 13330 | 11670 | 10000 | 8330 | 6670 | 5000 | 3330 | 1670 |

Station Local Time

| Station Latitude | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 |
| 80 | 180 | 195 | 210 | 225 | 240 | 255 | 270 | 285 | 300 | 315 | 330 | 345 |
| | 8890 | 8930 | 9040 | 9220 | 9450 | 9710 | 10000 | 10290 | 10550 | 10780 | 10960 | 11070 |
| 70 | 180 | 196 | 212 | 227 | 241 | 256 | 270 | 284 | 299 | 313 | 328 | 344 |
| | 7780 | 7860 | 8090 | 8440 | 8910 | 9440 | 10000 | 10560 | 11090 | 11560 | 11910 | 12140 |
| 60 | 180 | 197 | 214 | 229 | 243 | 257 | 270 | 283 | 297 | 311 | 326 | 343 |
| | 6670 | 6790 | 7150 | 7700 | 8390 | 9170 | 10000 | 10830 | 11610 | 12300 | 12850 | 13210 |
| 50 | 180 | 199 | 217 | 232 | 246 | 258 | 270 | 282 | 294 | 308 | 323 | 341 |
| | 5560 | 5740 | 6240 | 7000 | 7920 | 8940 | 10000 | 11060 | 12080 | 13000 | 13760 | 14260 |
| 40 | 180 | 203 | 222 | 237 | 250 | 260 | 270 | 280 | 290 | 303 | 318 | 337 |
| | 4440 | 4700 | 5380 | 6360 | 7500 | 8730 | 10000 | 11270 | 12500 | 13640 | 14620 | 15300 |
| 30 | 180 | 208 | 229 | 243 | 254 | 262 | 270 | 278 | 286 | 297 | 311 | 332 |
| | 3330 | 3690 | 4600 | 5800 | 7150 | 8560 | 10000 | 11440 | 12850 | 14200 | 15400 | 16310 |
| 20 | 180 | 218 | 239 | 251 | 259 | 265 | 270 | 275 | 281 | 289 | 301 | 322 |
| | 2220 | 2760 | 3950 | 5370 | 6890 | 8440 | 10000 | 11560 | 13110 | 14630 | 16050 | 17240 |
| 10 | 180 | 237 | 253 | 260 | 264 | 267 | 270 | 273 | 276 | 280 | 287 | 303 |
| | 1110 | 2000 | 3500 | 5100 | 6720 | 8360 | 10000 | 11640 | 13280 | 14900 | 16500 | 18000 |
| 0 | - | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 |
| | 0 | 1670 | 3330 | 5000 | 6670 | 8330 | 10000 | 11670 | 13330 | 15000 | 16670 | 18330 |

Table I. Azimuth in degrees clockwise from north (upper number) and distance in kilometers (lower number) of the subsolar point from a station in the northern hemisphere. Solar declination 0°.

Station Local Time

| Station Latitude | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -90 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 |
| -80 | 180<br>11110 | 165<br>11070 | 150<br>10960 | 135<br>10780 | 120<br>10550 | 105<br>10290 | 90<br>10000 | 75<br>9710 | 60<br>9450 | 45<br>9220 | 30<br>9040 | 15<br>8930 |
| -70 | 180<br>12220 | 164<br>12140 | 148<br>11910 | 133<br>11560 | 119<br>11090 | 104<br>10560 | 90<br>10000 | 76<br>9440 | 61<br>8910 | 47<br>8440 | 32<br>8090 | 16<br>7860 |
| -60 | 180<br>13330 | 163<br>13210 | 146<br>12850 | 131<br>12300 | 117<br>11610 | 103<br>10830 | 90<br>10000 | 77<br>9170 | 63<br>8390 | 49<br>7700 | 34<br>7150 | 17<br>6790 |
| -50 | 180<br>14440 | 161<br>14260 | 143<br>13760 | 128<br>13000 | 114<br>12080 | 102<br>11060 | 90<br>10000 | 78<br>8940 | 66<br>7920 | 52<br>7000 | 37<br>6240 | 19<br>5740 |
| -40 | 180<br>15560 | 157<br>15300 | 138<br>14620 | 123<br>13640 | 110<br>12500 | 100<br>11270 | 90<br>10000 | 80<br>8730 | 70<br>7500 | 57<br>6360 | 42<br>5380 | 23<br>4700 |
| -30 | 180<br>16670 | 152<br>16310 | 131<br>15400 | 117<br>14200 | 106<br>12850 | 98<br>11440 | 90<br>10000 | 82<br>8560 | 74<br>7150 | 63<br>5800 | 49<br>4600 | 28<br>3690 |
| -20 | 180<br>17780 | 142<br>17240 | 121<br>16050 | 109<br>14630 | 101<br>13110 | 95<br>11560 | 90<br>10000 | 85<br>8440 | 79<br>6890 | 71<br>5370 | 59<br>3950 | 38<br>2760 |
| -10 | 180<br>18890 | 123<br>18000 | 107<br>16500 | 100<br>14900 | 96<br>13280 | 93<br>11640 | 90<br>10000 | 87<br>8360 | 84<br>6720 | 80<br>5100 | 73<br>3500 | 57<br>2000 |
| 0 | ---<br>20000 | 90<br>18330 | 90<br>16670 | 90<br>15000 | 90<br>13330 | 90<br>11670 | 90<br>10000 | 90<br>8330 | 90<br>6670 | 90<br>5000 | 90<br>3330 | 90<br>1670 |

Station Local Time

| Station Latitude | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -90 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 | ---<br>10000 |
| -80 | 0<br>8890 | 345<br>8930 | 330<br>9040 | 315<br>9220 | 300<br>9450 | 285<br>9710 | 270<br>10000 | 255<br>10290 | 240<br>10550 | 225<br>10780 | 210<br>10960 | 195<br>11070 |
| -70 | 0<br>7780 | 344<br>7860 | 328<br>8090 | 313<br>8440 | 299<br>8910 | 284<br>9440 | 270<br>10000 | 256<br>10560 | 241<br>11090 | 227<br>11560 | 212<br>11910 | 196<br>12140 |
| -60 | 0<br>6670 | 343<br>6790 | 326<br>7150 | 311<br>7700 | 297<br>8390 | 283<br>9170 | 270<br>10000 | 257<br>10830 | 243<br>11610 | 229<br>12300 | 214<br>12850 | 197<br>13210 |
| -50 | 0<br>5560 | 341<br>5740 | 323<br>6240 | 308<br>7000 | 294<br>7920 | 282<br>8940 | 270<br>10000 | 258<br>11060 | 246<br>12080 | 232<br>13000 | 217<br>13760 | 199<br>14260 |
| -40 | 0<br>4440 | 337<br>4700 | 318<br>5380 | 303<br>6360 | 290<br>7500 | 280<br>8730 | 270<br>10000 | 260<br>11270 | 250<br>12500 | 237<br>13640 | 222<br>14620 | 203<br>15300 |
| -30 | 0<br>3330 | 332<br>3690 | 311<br>4600 | 297<br>5800 | 286<br>7150 | 278<br>8560 | 270<br>10000 | 262<br>11440 | 254<br>12850 | 243<br>14200 | 229<br>15400 | 208<br>16310 |
| -20 | 0<br>2220 | 322<br>2760 | 301<br>3950 | 289<br>5370 | 281<br>6890 | 275<br>8440 | 270<br>10000 | 265<br>11560 | 259<br>13110 | 251<br>14630 | 239<br>16050 | 218<br>17240 |
| -10 | 0<br>1110 | 303<br>2000 | 287<br>3500 | 280<br>5100 | 276<br>6720 | 273<br>8360 | 270<br>10000 | 267<br>11640 | 264<br>13280 | 260<br>14900 | 253<br>16500 | 237<br>18000 |
| 0 | ---<br>0 | 270<br>1670 | 270<br>3330 | 270<br>5000 | 270<br>6670 | 270<br>8330 | 270<br>10000 | 270<br>11670 | 270<br>13330 | 270<br>15000 | 270<br>16670 | 270<br>18330 |

Table II. Azimuth in degrees clockwise from north (upper number) and distance in kilometers (lower number) of the subsolar point from a station in the southern hemisphere. Solar declination 0°.

Station Local Time

| Station Latitude | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 |
| 80 | 0 8560 | 14 8520 | 28 8410 | 43 8250 | 57 8030 | 71 7770 | 86 7490 | 101 7200 | 116 6920 | 131 6690 | 147 6500 | 164 6380 |
| 70 | 0 9670 | 14 9600 | 27 9400 | 41 9080 | 55 8660 | 68 8160 | 82 7610 | 96 7040 | 111 6490 | 126 5990 | 143 5580 | 161 5320 |
| 60 | 0 10780 | 14 10680 | 27 10380 | 41 9920 | 53 9310 | 66 8590 | 78 7800 | 91 6970 | 104 6150 | 119 5380 | 137 4720 | 157 4270 |
| 50 | 0 11890 | 14 11760 | 28 11370 | 41 10760 | 53 10020 | 64 9070 | 75 8060 | 86 7010 | 97 5940 | 110 4900 | 128 3970 | 151 3270 |
| 40 | 0 13000 | 15 12830 | 30 12340 | 42 11590 | 53 10650 | 63 9560 | 72 8380 | 81 7140 | 90 5880 | 100 4600 | 115 3390 | 139 2360 |
| 30 | 0 14110 | 17 13900 | 32 13300 | 44 12400 | 55 11300 | 63 10070 | 70 8750 | 76 7370 | 82 5950 | 89 4510 | 97 3070 | 114 1680 |
| 20 | 0 15220 | 20 14950 | 36 14220 | 48 13170 | 57 11930 | 63 10580 | 68 9150 | 72 7670 | 75 6170 | 77 4650 | 78 3110 | 75 1590 |
| 10 | 0 16230 | 24 15990 | 41 15090 | 53 13890 | 60 12520 | 64 11070 | 67 9570 | 69 8040 | 69 6510 | 67 4990 | 62 3500 | 46 2150 |
| 0 | 0 17440 | 31 16970 | 50 15870 | 59 14510 | 64 13040 | 66 11530 | 67 10000 | 66 8470 | 64 6960 | 59 5490 | 50 4130 | 31 3030 |

Station Local Time

| Station Latitude | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 | --- 7440 |
| 80 | 180 6330 | 196 6380 | 213 6500 | 229 6690 | 244 6920 | 259 7200 | 274 7490 | 289 7770 | 303 8030 | 317 8250 | 332 8410 | 346 8520 |
| 70 | 180 5220 | 199 5320 | 217 5580 | 234 5990 | 249 6490 | 264 7040 | 278 7610 | 292 8160 | 305 8660 | 319 9080 | 333 9400 | 346 9600 |
| 60 | 180 4111 | 203 4270 | 223 4720 | 241 5380 | 256 6150 | 269 6970 | 282 7800 | 294 8590 | 307 9310 | 319 9920 | 333 10380 | 346 10680 |
| 50 | 180 3000 | 209 3270 | 232 3970 | 250 4900 | 263 5940 | 274 7010 | 285 8060 | 296 9070 | 307 10020 | 319 10760 | 332 11370 | 346 11760 |
| 40 | 180 1890 | 221 2360 | 245 3390 | 260 4600 | 270 5880 | 279 7140 | 288 8380 | 297 9560 | 307 10650 | 318 11590 | 330 12340 | 345 12830 |
| 30 | 180 780 | 246 1680 | 263 3070 | 271 4510 | 278 5950 | 284 7370 | 290 8750 | 297 10070 | 305 11300 | 316 12400 | 328 13300 | 343 13900 |
| 20 | 0 330 | 285 1590 | 282 3110 | 283 4650 | 285 6170 | 288 7670 | 292 9150 | 297 10580 | 303 11930 | 312 13170 | 324 14220 | 340 14950 |
| 10 | 0 1440 | 314 2150 | 298 3500 | 293 4990 | 291 6510 | 291 8040 | 293 9570 | 296 11070 | 300 12520 | 307 13890 | 319 15090 | 336 15990 |
| 0 | 0 2560 | 329 3030 | 310 4130 | 301 5490 | 296 6960 | 294 8470 | 293 10000 | 294 11530 | 296 13040 | 301 14510 | 310 15870 | 329 16970 |

Table III. Azimuth in degrees clockwise from north (upper number) and distance in kilometers (lower number) of the subsolar point from a station in the northern hemisphere. Solar declination $+23^{\circ}$.

Station Local Time

| Station Latitude | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| -90 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 |
| | 180 | 164 | 147 | 131 | 116 | 101 | 86 | 71 | 57 | 43 | 28 | 14 |
| -80 | 13670 | 13620 | 13500 | 13310 | 13080 | 12800 | 12510 | 12230 | 11970 | 11750 | 11590 | 11480 |
| | 180 | 161 | 143 | 126 | 111 | 96 | 82 | 68 | 55 | 41 | 27 | 14 |
| -70 | 14780 | 14680 | 14420 | 14010 | 13510 | 12960 | 12390 | 11840 | 11340 | 10920 | 10600 | 10400 |
| | 180 | 157 | 137 | 119 | 104 | 91 | 78 | 66 | 53 | 41 | 27 | 14 |
| -60 | 15890 | 15720 | 15280 | 14620 | 13850 | 13030 | 12200 | 11410 | 10690 | 10080 | 9620 | 9320 |
| | 180 | 151 | 128 | 110 | 97 | 86 | 75 | 64 | 53 | 41 | 28 | 14 |
| -50 | 17000 | 16730 | 16030 | 15100 | 14060 | 12990 | 11940 | 10930 | 9980 | 9240 | 8630 | 8240 |
| | 180 | 139 | 115 | 100 | 90 | 81 | 72 | 63 | 53 | 42 | 30 | 15 |
| -40 | 18110 | 17640 | 16610 | 15400 | 14120 | 12860 | 11620 | 10440 | 9350 | 8410 | 7660 | 7170 |
| | 180 | 114 | 97 | 89 | 82 | 76 | 70 | 63 | 55 | 44 | 32 | 17 |
| -30 | 19220 | 18320 | 16930 | 15490 | 14050 | 12630 | 11250 | 9930 | 8700 | 7600 | 6700 | 6100 |
| | 0 | 75 | 78 | 77 | 75 | 72 | 68 | 63 | 57 | 48 | 36 | 20 |
| -20 | 19670 | 18410 | 16890 | 15350 | 13830 | 12330 | 10850 | 9420 | 8070 | 6830 | 5780 | 5050 |
| | 0 | 46 | 62 | 67 | 69 | 69 | 67 | 64 | 60 | 53 | 41 | 24 |
| -10 | 18560 | 17850 | 16500 | 15010 | 13490 | 11960 | 10430 | 8930 | 7480 | 6110 | 4910 | 4010 |
| | 0 | 31 | 50 | 59 | 64 | 66 | 67 | 66 | 64 | 59 | 50 | 31 |
| 0 | 17440 | 16970 | 15870 | 14510 | 13040 | 11530 | 10000 | 8470 | 6960 | 5490 | 4130 | 3030 |

Station Local Time

| Station Latitude | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| -90 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 | 12560 |
| | 0 | 346 | 332 | 317 | 303 | 289 | 274 | 259 | 244 | 229 | 213 | 196 |
| -80 | 11440 | 11480 | 11590 | 11750 | 11970 | 12230 | 12510 | 12800 | 13080 | 13310 | 13500 | 13620 |
| | 0 | 346 | 333 | 319 | 305 | 292 | 278 | 264 | 249 | 234 | 217 | 199 |
| -70 | 10330 | 10400 | 10600 | 10920 | 11340 | 11840 | 12390 | 12960 | 13510 | 14010 | 14420 | 14680 |
| | 0 | 346 | 333 | 319 | 307 | 294 | 282 | 269 | 256 | 241 | 223 | 203 |
| -60 | 9220 | 9320 | 9620 | 10080 | 10690 | 11410 | 12200 | 13030 | 13850 | 14620 | 15280 | 15720 |
| | 0 | 346 | 332 | 319 | 307 | 296 | 285 | 274 | 263 | 250 | 232 | 209 |
| -50 | 8110 | 8240 | 8630 | 9240 | 9980 | 10930 | 11940 | 12990 | 14060 | 15100 | 16030 | 16730 |
| | 0 | 345 | 330 | 318 | 307 | 297 | 288 | 279 | 270 | 260 | 245 | 221 |
| -40 | 7000 | 7170 | 7660 | 8410 | 9350 | 10440 | 11620 | 12860 | 14120 | 15400 | 16610 | 17640 |
| | 0 | 343 | 328 | 316 | 305 | 297 | 290 | 284 | 278 | 271 | 263 | 246 |
| -30 | 5890 | 6100 | 6700 | 7600 | 8700 | 9930 | 11250 | 12630 | 14050 | 15490 | 16930 | 18320 |
| | 0 | 340 | 324 | 312 | 303 | 297 | 292 | 288 | 285 | 283 | 282 | 285 |
| -20 | 4780 | 5050 | 5780 | 6830 | 8070 | 9420 | 10850 | 12330 | 13830 | 15350 | 16890 | 18410 |
| | 0 | 336 | 319 | 307 | 300 | 296 | 293 | 291 | 291 | 293 | 298 | 314 |
| -10 | 3670 | 4010 | 4910 | 6110 | 7480 | 8930 | 10430 | 11960 | 13490 | 15010 | 16500 | 17850 |
| | 0 | 329 | 310 | 301 | 296 | 294 | 293 | 294 | 296 | 301 | 310 | 329 |
| 0 | 2560 | 3030 | 4130 | 5490 | 6960 | 8470 | 10000 | 11530 | 13040 | 14510 | 15870 | 16970 |

Table IV. Azimuth in degrees clockwise from north (upper number) and distance in kilometers (lower number) of the subsolar point from a station in the southern hemisphere. Solar declination +23°.

Station Local Time

| Station Latitude | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 |
| 80 | 0<br>13670 | 16<br>13620 | 33<br>13500 | 49<br>13310 | 64<br>13050 | 79<br>12800 | 94<br>12510 | 109<br>12230 | 123<br>11970 | 137<br>11750 | 152<br>11590 | 166<br>11480 |
| 70 | 0<br>14780 | 19<br>14680 | 37<br>14420 | 54<br>14010 | 69<br>13510 | 84<br>12960 | 98<br>12390 | 112<br>11840 | 125<br>11340 | 139<br>10920 | 153<br>10600 | 166<br>10400 |
| 60 | 0<br>15890 | 23<br>15720 | 43<br>15280 | 61<br>14620 | 76<br>13850 | 89<br>13030 | 102<br>12200 | 114<br>11410 | 127<br>10690 | 139<br>10080 | 153<br>9620 | 166<br>9320 |
| 50 | 0<br>17000 | 29<br>16730 | 52<br>16030 | 70<br>15100 | 83<br>14060 | 94<br>12990 | 105<br>11940 | 116<br>10930 | 127<br>9980 | 139<br>9240 | 152<br>8630 | 166<br>8240 |
| 40 | 0<br>18110 | 41<br>17640 | 65<br>16610 | 80<br>15400 | 90<br>14120 | 99<br>12860 | 108<br>11620 | 117<br>10440 | 127<br>9350 | 138<br>8410 | 150<br>7660 | 165<br>7170 |
| 30 | 0<br>19220 | 66<br>18320 | 83<br>16930 | 91<br>15490 | 98<br>14050 | 104<br>12630 | 110<br>11250 | 117<br>9930 | 125<br>8700 | 136<br>7600 | 148<br>6700 | 163<br>6100 |
| 20 | 180<br>19670 | 105<br>18410 | 102<br>16890 | 103<br>15350 | 105<br>13830 | 108<br>12330 | 112<br>10850 | 117<br>9420 | 123<br>8070 | 132<br>6830 | 144<br>5780 | 160<br>5050 |
| 10 | 180<br>18560 | 134<br>17850 | 118<br>16500 | 113<br>15010 | 111<br>13490 | 111<br>11960 | 113<br>10430 | 116<br>8930 | 120<br>7480 | 127<br>6110 | 139<br>4910 | 156<br>4010 |
| 0 | 180<br>17440 | 149<br>16970 | 130<br>15870 | 121<br>14510 | 116<br>13040 | 114<br>11530 | 113<br>10000 | 114<br>8470 | 116<br>6960 | 121<br>5490 | 130<br>4130 | 149<br>3030 |

Station Local Time

| Station Latitude | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 | —<br>12560 |
| 80 | 180<br>11440 | 194<br>11480 | 208<br>11590 | 223<br>11750 | 237<br>11970 | 251<br>12230 | 266<br>12510 | 281<br>12800 | 296<br>13080 | 311<br>13310 | 327<br>13500 | 344<br>13620 |
| 70 | 180<br>10330 | 194<br>10400 | 207<br>10600 | 221<br>10920 | 235<br>11340 | 248<br>11840 | 262<br>12390 | 276<br>12960 | 291<br>13510 | 306<br>14010 | 323<br>14420 | 341<br>14680 |
| 60 | 180<br>9220 | 194<br>9320 | 207<br>9620 | 221<br>10080 | 233<br>10690 | 246<br>11410 | 258<br>12200 | 271<br>13030 | 284<br>13850 | 299<br>14620 | 317<br>15280 | 337<br>15720 |
| 50 | 180<br>8110 | 194<br>8240 | 208<br>8630 | 221<br>9240 | 233<br>9980 | 244<br>10930 | 255<br>11940 | 266<br>12990 | 277<br>14060 | 290<br>15100 | 308<br>16030 | 331<br>16730 |
| 40 | 180<br>7000 | 195<br>7170 | 210<br>7660 | 222<br>8410 | 233<br>9350 | 243<br>10440 | 252<br>11620 | 261<br>12860 | 270<br>14120 | 280<br>15400 | 295<br>16610 | 319<br>17640 |
| 30 | 180<br>5890 | 197<br>6100 | 212<br>6700 | 224<br>7600 | 235<br>8700 | 243<br>9930 | 250<br>11250 | 256<br>12630 | 262<br>14050 | 269<br>15490 | 277<br>16930 | 294<br>18320 |
| 20 | 180<br>4780 | 200<br>5050 | 216<br>5780 | 228<br>6830 | 237<br>8070 | 243<br>9420 | 248<br>10850 | 252<br>12330 | 255<br>13830 | 257<br>15350 | 258<br>16890 | 255<br>18410 |
| 10 | 180<br>3670 | 204<br>4010 | 221<br>4910 | 233<br>6110 | 240<br>7480 | 244<br>8930 | 247<br>10430 | 249<br>11960 | 249<br>13490 | 247<br>15010 | 242<br>16500 | 226<br>17850 |
| 0 | 180<br>2560 | 211<br>3030 | 230<br>4130 | 239<br>5490 | 244<br>6960 | 246<br>8470 | 247<br>10000 | 246<br>11530 | 244<br>13040 | 239<br>14510 | 230<br>15870 | 211<br>16970 |

Table V. Azimuth in degrees clockwise from north (upper number) and distance in kilometers (lower number) of the subsolar point from a station in the northern hemisphere. Solar declination -23°.

Station Local Time

| Station Latitude | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -90 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 |
| -80 | 180 | 166 | 152 | 137 | 123 | 109 | 94 | 79 | 64 | 49 | 33 | 16 |
| | 8560 | 8520 | 8410 | 8250 | 8030 | 7770 | 7490 | 7200 | 6920 | 6690 | 6500 | 6380 |
| -70 | 180 | 166 | 153 | 139 | 125 | 112 | 98 | 84 | 69 | 54 | 37 | 19 |
| | 9670 | 9600 | 9400 | 9080 | 8660 | 8160 | 7610 | 7040 | 6490 | 5990 | 5580 | 5320 |
| -60 | 180 | 166 | 153 | 139 | 127 | 114 | 102 | 89 | 76 | 61 | 43 | 23 |
| | 10780 | 10680 | 10380 | 9920 | 9310 | 8590 | 7800 | 6970 | 6150 | 5380 | 4720 | 4270 |
| -50 | 180 | 166 | 152 | 139 | 127 | 116 | 105 | 94 | 83 | 70 | 52 | 29 |
| | 11890 | 11760 | 11370 | 10760 | 10020 | 9070 | 8060 | 7010 | 5940 | 4900 | 3970 | 3270 |
| -40 | 180 | 165 | 150 | 138 | 127 | 117 | 108 | 99 | 90 | 80 | 65 | 41 |
| | 13000 | 12830 | 12340 | 11590 | 10650 | 9560 | 8380 | 7140 | 5880 | 4600 | 3390 | 2360 |
| -30 | 180 | 163 | 148 | 136 | 125 | 117 | 110 | 104 | 98 | 91 | 83 | 66 |
| | 14110 | 13900 | 13300 | 12400 | 11300 | 10070 | 8750 | 7370 | 5950 | 4510 | 3070 | 1680 |
| -20 | 180 | 160 | 144 | 132 | 123 | 117 | 112 | 108 | 105 | 103 | 102 | 105 |
| | 15220 | 14950 | 14220 | 13170 | 11930 | 10580 | 9150 | 7670 | 6170 | 4650 | 3110 | 1590 |
| -10 | 180 | 156 | 139 | 127 | 120 | 116 | 113 | 111 | 111 | 113 | 118 | 134 |
| | 16230 | 15990 | 15090 | 13890 | 12520 | 11070 | 9570 | 8040 | 6510 | 4990 | 3500 | 2150 |
| 0 | 180 | 149 | 130 | 121 | 116 | 114 | 113 | 114 | 116 | 121 | 130 | 149 |
| | 17440 | 16970 | 15870 | 14510 | 13040 | 11530 | 10000 | 8470 | 6960 | 5490 | 4130 | 3030 |

Station Local Time

| Station Latitude | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -90 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 | 7440 |
| -80 | 0 | 344 | 327 | 311 | 296 | 281 | 266 | 251 | 237 | 223 | 208 | 194 |
| | 6330 | 6380 | 6500 | 6690 | 6920 | 7200 | 7490 | 7770 | 8030 | 8250 | 8410 | 8520 |
| -70 | 0 | 341 | 323 | 306 | 291 | 276 | 262 | 248 | 235 | 221 | 207 | 194 |
| | 5220 | 5320 | 5550 | 5990 | 6490 | 7040 | 7610 | 8160 | 8660 | 9080 | 9400 | 9600 |
| -60 | 0 | 337 | 317 | 299 | 284 | 271 | 258 | 246 | 233 | 221 | 207 | 194 |
| | 4111 | 4270 | 4720 | 5380 | 6150 | 6970 | 7800 | 8590 | 9310 | 9920 | 10380 | 10680 |
| -50 | 0 | 331 | 308 | 290 | 277 | 266 | 255 | 244 | 233 | 221 | 208 | 194 |
| | 3000 | 3270 | 3970 | 4900 | 5940 | 7010 | 8060 | 9070 | 10020 | 10760 | 11370 | 11760 |
| -40 | 0 | 319 | 295 | 280 | 270 | 261 | 252 | 243 | 233 | 222 | 210 | 195 |
| | 1890 | 2360 | 3390 | 4600 | 5880 | 7140 | 8380 | 9560 | 10650 | 11590 | 12340 | 12830 |
| -30 | 0 | 294 | 277 | 269 | 262 | 256 | 250 | 243 | 235 | 224 | 212 | 197 |
| | 780 | 1680 | 3070 | 4510 | 5950 | 7370 | 8750 | 10070 | 11300 | 12400 | 13300 | 13900 |
| -20 | 180 | 255 | 258 | 257 | 255 | 252 | 248 | 243 | 237 | 228 | 216 | 200 |
| | 330 | 1590 | 3110 | 4650 | 6170 | 7670 | 9150 | 10580 | 11930 | 13170 | 14220 | 14950 |
| -10 | 180 | 226 | 242 | 247 | 249 | 249 | 247 | 244 | 240 | 233 | 221 | 204 |
| | 1440 | 2150 | 3500 | 4990 | 6510 | 8040 | 9570 | 11070 | 12520 | 13890 | 15090 | 15990 |
| 0 | 180 | 211 | 230 | 239 | 244 | 246 | 247 | 246 | 244 | 239 | 230 | 211 |
| | 2560 | 3030 | 4130 | 5490 | 6960 | 8470 | 10000 | 11530 | 13040 | 14510 | 15870 | 16970 |

Table VI. Azimuth in degrees clockwise from north (upper number) and distance in kilometers (lower number) of the subsolar point from a station in the southern hemisphere. Solar declination -23°.

Table VII

Solar declination = 0°

| | Distance from transmitting station to subsolar point. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2500 km | | 5000 km | | 7500 km | | 10000 km | | 12500 km | | 15000 km | | 17500 km | |
| Lat. | t | a | t | a | t | a | t | a | t | a | t | a | t | a |
| | | | | | | | 06.0 | 90 | | | | | | |
| +70° | - | - | - | - | - | - | 18.0 | 270 | - | - | - | - | - | - |
| | | | | | 10.3 | 153 | 06.0 | 90 | 01.7 | 27 | | | | |
| +65° | - | - | - | - | 13.7 | 207 | 18.0 | 270 | 22.3 | 333 | - | - | - | - |
| | | | | | 09.3 | 136 | 06.0 | 90 | 02.7 | 44 | | | | |
| +60° | - | - | - | - | 14.7 | 224 | 18.0 | 270 | 21.3 | 316 | - | - | - | - |
| | | | | | 08.8 | 128 | 06.0 | 90 | 03.2 | 52 | | | | |
| +55° | - | - | - | - | 15.2 | 232 | 18.0 | 270 | 20.8 | 308 | - | - | - | - |
| | | | | | 08.5 | 121 | 06.0 | 90 | 03.5 | 59 | | | | |
| +50° | - | - | - | - | 15.5 | 239 | 18.0 | 270 | 20.5 | 301 | - | - | - | - |
| | | | 12.0 | 180 | 08.3 | 115 | 06.0 | 90 | 03.7 | 65 | 00.0 | 00 | | |
| +45° | - | - | 12.0 | 180 | 15.7 | 245 | 18.0 | 270 | 20.3 | 295 | 24.0 | 360 | - | - |
| | | | 10.5 | 147 | 08.1 | 110 | 06.0 | 90 | 03.9 | 70 | 01.5 | 33 | | |
| +40° | - | - | 13.5 | 213 | 15.9 | 250 | 18.0 | 270 | 20.1 | 290 | 22.5 | 327 | - | - |
| | | | 09.9 | 137 | 07.9 | 107 | 06.0 | 90 | 04.1 | 73 | 02.1 | 43 | | |
| +35° | - | - | 14.1 | 223 | 16.1 | 253 | 18.0 | 270 | 19.9 | 287 | 21.9 | 317 | - | - |
| | | | 09.6 | 126 | 07.8 | 104 | 06.0 | 90 | 04.2 | 76 | 02.4 | 54 | | |
| +30° | - | - | 14.4 | 234 | 16.2 | 256 | 18.0 | 270 | 19.8 | 284 | 21.6 | 306 | - | - |
| | | | 09.4 | 118 | 07.7 | 101 | 06.0 | 90 | 04.3 | 79 | 02.6 | 62 | | |
| +25° | - | - | 14.6 | 242 | 16.3 | 259 | 18.0 | 270 | 19.7 | 281 | 21.4 | 298 | - | - |
| | 11.3 | 150 | 09.2 | 112 | 07.6 | 98 | 06.0 | 90 | 04.4 | 82 | 02.8 | 68 | 00.7 | 30 |
| +20° | 12.7 | 210 | 14.8 | 248 | 16.4 | 262 | 18.0 | 270 | 19.6 | 278 | 21.2 | 292 | 23.3 | 330 |
| | 10.8 | 130 | 09.1 | 106 | 07.6 | 96 | 06.0 | 90 | 04.4 | 84 | 02.9 | 74 | 01.2 | 50 |
| +15° | 13.2 | 230 | 14.9 | 254 | 16.4 | 264 | 18.0 | 270 | 19.6 | 276 | 21.1 | 286 | 22.8 | 310 |
| | 10.6 | 114 | 09.1 | 100 | 07.5 | 94 | 06.0 | 90 | 04.5 | 86 | 02.9 | 80 | 01.4 | 66 |
| +10° | 13.4 | 246 | 14.9 | 260 | 16.5 | 266 | 18.0 | 270 | 19.5 | 274 | 21.1 | 280 | 22.6 | 294 |
| | 10.5 | 101 | 09.0 | 95 | 07.5 | 92 | 06.0 | 90 | 04.5 | 88 | 03.0 | 85 | 01.5 | 79 |
| + 5° | 13.5 | 259 | 15.0 | 265 | 16.5 | 268 | 18.0 | 270 | 19.5 | 272 | 21.0 | 275 | 22.5 | 281 |
| | 10.5 | 90 | 09.0 | 90 | 07.5 | 90 | 06.0 | 90 | 04.5 | 90 | 03.0 | 90 | 01.5 | 90 |
| 0° | 13.5 | 270 | 15.0 | 270 | 16.5 | 270 | 18.0 | 270 | 19.5 | 270 | 21.0 | 270 | 22.5 | 270 |

t = apparent solar time at the transmitting station.

a = azimuth of subsolar point from the transmitting station.

Table VIII

Solar declination = 0°

| | Distance from transmitting station to subsolar point. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2500 km | | 5000 km | | 7500 km | | 10000 km | | 12500 km | | 15000 km | | 17500 km | |
| Lat. | t | a | t | a | t | a | t | a | t | a | t | a | t | a |
| | | | | | | | 06.0 | 90 | | | | | | |
| -70° | - | - | - | - | - | - | 18.0 | 270 | - | - | - | - | - | - |
| | | | | | 10.3 | 27 | 06.0 | 90 | 01.7 | 153 | | | | |
| -65° | - | - | - | - | 13.7 | 333 | 18.0 | 270 | 22.3 | 207 | - | - | - | - |
| | | | | | 09.3 | 44 | 06.0 | 90 | 02.7 | 136 | | | | |
| -60° | - | - | - | - | 14.7 | 316 | 18.0 | 270 | 21.3 | 224 | - | - | - | - |
| | | | | | 08.8 | 52 | 06.0 | 90 | 03.2 | 128 | | | | |
| -55° | - | - | - | - | 15.2 | 308 | 18.0 | 270 | 20.8 | 232 | - | - | - | - |
| | | | | | 08.5 | 59 | 06.0 | 90 | 03.5 | 121 | | | | |
| -50° | - | - | - | - | 15.5 | 301 | 18.0 | 270 | 20.5 | 239 | - | - | - | - |
| | | | 12.0 | 00 | 08.3 | 65 | 06.0 | 90 | 03.7 | 115 | 00.0 | 180 | | |
| -45° | - | - | 12.0 | 360 | 15.7 | 295 | 18.0 | 270 | 20.3 | 245 | 24.0 | 180 | - | - |
| | | | 10.5 | 33 | 08.1 | 70 | 06.0 | 90 | 03.9 | 110 | 01.5 | 147 | | |
| -40° | - | - | 13.5 | 327 | 15.9 | 290 | 18.0 | 270 | 20.1 | 250 | 22.5 | 213 | - | - |
| | | | 09.9 | 43 | 07.9 | 73 | 06.0 | 90 | 04.1 | 107 | 02.1 | 137 | | |
| -35° | - | - | 14.1 | 317 | 16.1 | 287 | 18.0 | 270 | 19.9 | 253 | 21.9 | 223 | - | - |
| | | | 09.6 | 54 | 07.8 | 76 | 06.0 | 90 | 04.2 | 104 | 02.4 | 126 | | |
| -30° | - | - | 14.4 | 306 | 16.2 | 284 | 18.0 | 270 | 19.8 | 256 | 21.6 | 234 | - | - |
| | | | 09.4 | 62 | 07.7 | 79 | 06.0 | 90 | 04.3 | 101 | 02.6 | 118 | | |
| -25° | - | - | 14.6 | 298 | 16.3 | 281 | 18.0 | 270 | 19.7 | 259 | 21.4 | 242 | - | - |
| | 11.3 | -30 | 09.2 | 68 | 07.6 | 82 | 06.0 | 90 | 04.4 | 98 | 02.8 | 112 | 00.7 | 150 |
| -20° | 12.7 | 330 | 14.8 | 292 | 16.4 | 278 | 18.0 | 270 | 19.6 | 262 | 21.2 | 248 | 23.3 | 210 |
| | 10.8 | 50 | 09.1 | 74 | 07.6 | 84 | 06.0 | 90 | 04.4 | 96 | 02.9 | 106 | 01.2 | 130 |
| -15° | 13.2 | 310 | 14.9 | 286 | 16.4 | 276 | 18.0 | 270 | 19.6 | 264 | 21.1 | 254 | 22.8 | 230 |
| | 10.6 | 66 | 09.1 | 80 | 07.5 | 86 | 06.0 | 90 | 04.5 | 94 | 02.9 | 100 | 01.4 | 114 |
| -10° | 13.4 | 294 | 14.9 | 280 | 16.5 | 274 | 18.0 | 270 | 19.5 | 266 | 21.1 | 260 | 22.6 | 246 |
| | 10.5 | 79 | 09.0 | 85 | 07.5 | 88 | 06.0 | 90 | 04.5 | 92 | 03.0 | 95 | 01.5 | 101 |
| - 5° | 13.5 | 281 | 15.0 | 275 | 16.5 | 272 | 18.0 | 270 | 19.5 | 268 | 21.0 | 265 | 22.5 | 259 |
| | 10.5 | 90 | 09.0 | 90 | 07.5 | 90 | 06.0 | 90 | 04.5 | 90 | 03.0 | 90 | 01.5 | 90 |
| 0° | 13.5 | 270 | 15.0 | 270 | 16.5 | 270 | 18.0 | 270 | 19.5 | 270 | 21.0 | 270 | 22.5 | 270 |

t = apparent solar time at the transmitting station.

a = azimuth of subsolar point from the transmitting station.

Table IX

Solar declination = + 23°

| | Distance from transmitting station to subsolar point. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2500 km | | 5000 km | | 7500 km | | 10000 km | | 12500 km | | 15000 km | | 17500 km | |
| Lat. | t | a | t | a | t | a | t | a | t | a | t | a | t | a |
| | | | | | 06.2 | 85 | | | | | | | | |
| +70° | - | - | - | - | 17.8 | 275 | - | - | - | - | - | - | - | - |
| | | | 10.5 | 152 | 06.2 | 84 | 01.7 | 24 | | | | | | |
| +65° | - | - | 13.5 | 208 | 17.8 | 276 | 22.3 | 336 | - | - | - | - | - | - |
| | | | 09.6 | 129 | 06.3 | 83 | 02.8 | 39 | | | | | | |
| +60° | - | - | 14.4 | 231 | 17.7 | 277 | 21.2 | 321 | - | - | - | - | - | - |
| | | | 09.1 | 117 | 06.4 | 82 | 03.5 | 48 | | | | | | |
| +55° | - | - | 14.9 | 243 | 17.6 | 278 | 20.5 | 312 | - | - | - | - | - | - |
| | | | 08.9 | 109 | 06.5 | 81 | 04.0 | 53 | | | | | | |
| +50° | - | - | 15.1 | 251 | 17.5 | 279 | 20.0 | 307 | - | - | - | - | - | - |
| | 11.8 | 164 | 08.8 | 103 | 06.6 | 79 | 04.3 | 56 | 00.0 | 00 | | | | |
| +45° | 12.2 | 196 | 15.2 | 257 | 17.4 | 281 | 19.7 | 304 | 24.0 | 360 | - | - | - | - |
| | 10.9 | 134 | 08.7 | 97 | 06.7 | 78 | 04.7 | 59 | 01.7 | 25 | | | | |
| +40° | 13.1 | 226 | 15.3 | 263 | 17.3 | 282 | 19.3 | 301 | 22.3 | 335 | - | - | - | - |
| | 10.5 | 116 | 08.7 | 92 | 06.8 | 77 | 04.9 | 61 | 02.4 | 35 | | | | |
| +35° | 13.5 | 244 | 15.3 | 268 | 17.2 | 283 | 19.1 | 299 | 21.6 | 325 | - | - | - | - |
| | 10.4 | 102 | 08.7 | 87 | 06.9 | 75 | 05.1 | 63 | 02.9 | 43 | | | | |
| +30° | 13.6 | 258 | 15.3 | 273 | 17.1 | 285 | 18.9 | 297 | 21.1 | 317 | - | - | - | - |
| | 10.3 | 90 | 08.7 | 82 | 07.0 | 74 | 05.3 | 64 | 03.3 | 48 | | | | |
| +25° | 13.7 | 270 | 15.3 | 278 | 17.0 | 286 | 18.7 | 296 | 20.7 | 312 | - | - | - | - |
| | 10.4 | 77 | 08.8 | 77 | 07.1 | 72 | 05.4 | 65 | 03.6 | 53 | 00.8 | 16 | | |
| +20° | 13.6 | 283 | 15.2 | 283 | 16.9 | 288 | 18.6 | 295 | 20.4 | 307 | 23.2 | 344 | - | - |
| | 10.5 | 65 | 08.9 | 72 | 07.2 | 71 | 05.6 | 66 | 03.8 | 57 | 01.6 | 32 | | |
| +15° | 13.5 | 295 | 15.1 | 288 | 16.8 | 289 | 18.4 | 294 | 20.2 | 303 | 22.4 | 328 | - | - |
| | 10.7 | 52 | 09.0 | 68 | 07.4 | 69 | 05.7 | 66 | 04.1 | 60 | 02.1 | 42 | | |
| +10° | 13.3 | 308 | 15.0 | 292 | 16.6 | 291 | 18.3 | 294 | 19.9 | 300 | 21.9 | 318 | - | - |
| | 11.1 | 34 | 09.2 | 63 | 07.5 | 67 | 05.9 | 67 | 04.2 | 63 | 02.4 | 50 | | |
| + 5° | 12.9 | 326 | 14.8 | 297 | 16.5 | 293 | 18.1 | 293 | 19.8 | 297 | 21.6 | 310 | - | - |
| | 12.0 | 00 | 09.4 | 57 | 07.7 | 65 | 06.0 | 67 | 04.4 | 65 | 02.6 | 57 | 00.0 | 00 |
| 0° | 12.0 | 360 | 14.6 | 303 | 16.3 | 295 | 18.0 | 293 | 19.6 | 295 | 21.4 | 303 | 24.0 | 360 |

t = apparent solar time at the transmitting station.

a = azimuth of subsolar point from the transmitting station.

Table X

Solar declination = + 23°

| | Distance from transmitting station to subsolar point. | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2500 km | | 5000 km | | 7500 km | | 10000 km | | 12500 km | | 15000 km | | 17500 km | |
| Lat. | t | a | t | a | t | a | t | a | t | a | t | a | t | a |
| -70° | - | - | - | - | - | - | - | - | 05.8<br>18.2 | 85<br>275 | - | - | - | - |
| -65° | - | - | - | - | - | - | 10.3<br>13.7 | 24<br>336 | 05.8<br>18.2 | 84<br>276 | 01.5<br>22.5 | 152<br>208 | - | - |
| -60° | - | - | - | - | - | - | 09.2<br>14.8 | 39<br>321 | 05.7<br>18.3 | 83<br>277 | 02.4<br>21.6 | 129<br>231 | - | - |
| -55° | - | - | - | - | - | - | 08.5<br>15.5 | 48<br>312 | 05.6<br>18.4 | 82<br>278 | 02.9<br>21.1 | 117<br>243 | - | - |
| -50° | - | - | - | - | - | - | 08.0<br>16.0 | 53<br>307 | 05.5<br>18.5 | 81<br>279 | 03.1<br>20.9 | 109<br>251 | - | - |
| -45° | - | - | - | - | 12.0<br>12.0 | 00<br>360 | 07.7<br>16.3 | 56<br>304 | 05.4<br>18.6 | 79<br>281 | 03.2<br>20.8 | 103<br>257 | 00.2<br>23.8 | 164<br>196 |
| -40° | - | - | - | - | 10.3<br>13.7 | 25<br>335 | 07.3<br>16.7 | 59<br>301 | 05.3<br>18.7 | 78<br>282 | 03.3<br>20.7 | 97<br>263 | 01.1<br>22.9 | 134<br>226 |
| -35° | - | - | - | - | 09.6<br>14.4 | 35<br>325 | 07.1<br>16.9 | 61<br>299 | 05.2<br>18.8 | 77<br>283 | 03.3<br>20.7 | 92<br>268 | 01.5<br>22.5 | 116<br>244 |
| -30° | - | - | - | - | 09.1<br>14.9 | 43<br>317 | 06.9<br>17.1 | 63<br>297 | 05.1<br>18.9 | 75<br>285 | 03.3<br>20.7 | 87<br>273 | 01.6<br>22.4 | 102<br>258 |
| -25° | - | - | - | - | 08.8<br>15.2 | 48<br>312 | 06.7<br>17.3 | 64<br>296 | 05.0<br>19.0 | 74<br>286 | 03.3<br>20.7 | 82<br>278 | 01.7<br>22.3 | 90<br>270 |
| -20° | - | - | 11.2<br>12.8 | 16<br>344 | 08.5<br>15.5 | 53<br>307 | 06.6<br>17.4 | 65<br>295 | 04.9<br>19.1 | 72<br>288 | 03.2<br>20.8 | 77<br>283 | 01.6<br>22.4 | 77<br>283 |
| -15° | - | - | 10.4<br>13.6 | 32<br>328 | 08.2<br>15.8 | 57<br>303 | 06.4<br>17.6 | 66<br>294 | 04.7<br>19.3 | 71<br>289 | 03.1<br>20.9 | 72<br>288 | 01.5<br>22.5 | 65<br>295 |
| -10° | - | - | 09.9<br>14.1 | 42<br>318 | 08.0<br>16.0 | 60<br>300 | 06.3<br>17.7 | 66<br>294 | 04.6<br>19.4 | 69<br>291 | 03.0<br>21.0 | 68<br>292 | 01.3<br>22.7 | 52<br>308 |
| - 5° | - | - | 09.6<br>14.4 | 50<br>310 | 07.8<br>16.2 | 63<br>297 | 06.1<br>17.9 | 67<br>293 | 04.5<br>19.5 | 67<br>293 | 02.8<br>21.2 | 63<br>297 | 00.9<br>23.1 | 34<br>326 |
| 0° | 12.0<br>12.0 | 00<br>360 | 09.4<br>14.6 | 57<br>303 | 07.7<br>16.3 | 65<br>295 | 06.0<br>18.0 | 67<br>293 | 04.4<br>19.6 | 65<br>295 | 02.6<br>21.4 | 57<br>303 | 00.0<br>24.0 | 00<br>360 |

t = apparent solar time at the transmitting station.

a = azimuth of subsolar point from the transmitting station.

Table XI

Solar declination = - 23°

| | Distance from transmitting station to subsolar point. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2500 km | | 5000 km | | 7500 km | | 10000 km | | 12500 km | | 15000 km | | 17500 km | |
| Lat. | t | a | t | a | t | a | t | a | t | a | t | a | t | a |
| | | | | | | | | | 05.8 | 95 | | | | |
| +70° | - | - | - | - | - | - | - | - | 18.2 | 265 | - | - | - | - |
| | | | | | | | 10.3 | 156 | 05.8 | 96 | 01.5 | 28 | | |
| +65° | - | - | - | - | - | - | 13.7 | 204 | 18.2 | 264 | 22.5 | 332 | - | - |
| | | | | | | | 09.2 | 141 | 05.7 | 97 | 02.4 | 51 | | |
| +60° | - | - | - | - | - | - | 14.8 | 219 | 18.3 | 263 | 21.6 | 309 | - | - |
| | | | | | | | 08.5 | 132 | 05.6 | 98 | 02.9 | 63 | | |
| +55° | - | - | - | - | - | - | 15.5 | 228 | 18.4 | 262 | 21.1 | 297 | - | - |
| | | | | | | | 08.0 | 127 | 05.5 | 99 | 03.1 | 71 | | |
| +50° | - | - | - | - | - | - | 16.0 | 233 | 18.5 | 261 | 20.9 | 289 | - | - |
| | | | | | 12.0 | 180 | 07.7 | 124 | 05.4 | 101 | 03.2 | 77 | 00.2 | 16 |
| +45° | - | - | - | - | 12.0 | 180 | 16.3 | 236 | 18.6 | 259 | 20.8 | 283 | 23.8 | 344 |
| | | | | | 10.3 | 155 | 07.3 | 121 | 05.3 | 102 | 03.3 | 83 | 01.1 | 46 |
| +40° | - | - | - | - | 13.7 | 205 | 16.7 | 239 | 18.7 | 258 | 20.7 | 277 | 22.9 | 314 |
| | | | | | 09.6 | 145 | 07.1 | 119 | 05.2 | 103 | 03.3 | 88 | 01.5 | 64 |
| +35° | - | - | - | - | 14.4 | 215 | 16.9 | 241 | 18.8 | 257 | 20.7 | 272 | 22.5 | 296 |
| | | | | | 09.1 | 137 | 06.9 | 117 | 05.1 | 105 | 03.3 | 93 | 01.6 | 78 |
| +30° | - | - | - | - | 14.9 | 223 | 17.1 | 243 | 18.9 | 255 | 20.7 | 267 | 22.4 | 282 |
| | | | | | 08.8 | 132 | 06.7 | 116 | 05.0 | 106 | 03.3 | 98 | 01.7 | 90 |
| +25° | - | - | - | - | 15.2 | 228 | 17.3 | 244 | 19.0 | 254 | 20.7 | 262 | 22.3 | 270 |
| | | | 11.2 | 164 | 08.5 | 127 | 06.6 | 115 | 04.9 | 108 | 03.2 | 103 | 01.6 | 103 |
| +20° | - | - | 12.8 | 196 | 15.5 | 233 | 17.4 | 245 | 19.1 | 252 | 20.8 | 257 | 22.4 | 257 |
| | | | 10.4 | 148 | 08.2 | 123 | 06.4 | 114 | 04.7 | 109 | 03.1 | 108 | 01.5 | 115 |
| +15° | - | - | 13.6 | 212 | 15.8 | 237 | 17.6 | 246 | 19.3 | 251 | 20.9 | 252 | 22.5 | 245 |
| | | | 09.9 | 138 | 08.0 | 120 | 06.3 | 114 | 04.6 | 111 | 03.0 | 112 | 01.3 | 128 |
| +10° | - | - | 14.1 | 222 | 16.0 | 240 | 17.7 | 246 | 19.4 | 249 | 21.0 | 248 | 22.7 | 232 |
| | | | 09.6 | 130 | 07.8 | 117 | 06.1 | 113 | 04.5 | 113 | 02.8 | 117 | 00.9 | 146 |
| + 5° | - | - | 14.4 | 230 | 16.2 | 243 | 17.9 | 247 | 19.5 | 247 | 21.2 | 243 | 23.1 | 214 |
| | 12.0 | 180 | 09.4 | 123 | 07.7 | 115 | 06.0 | 113 | 04.4 | 115 | 02.6 | 123 | 00.0 | 180 |
| 0° | 12.0 | 180 | 14.6 | 237 | 16.3 | 245 | 18.0 | 247 | 19.6 | 245 | 21.4 | 237 | 24.0 | 180 |

t = apparent solar time at the transmitting station.

a = azimuth of subsolar point from the transmitting station.

Table XII

Solar declination = - 23°

| | Distance from transmitting station to subsolar point. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2500 km | | 5000 km | | 7500 km | | 10000 km | | 12500 km | | 15000 km | | 17500 km | |
| Lat. | t | a | t | a | t | a | t | a | t | a | t | a | t | a |
| | | | | | 06.2 | 95 | | | | | | | | |
| -70° | - | - | - | - | 17.8 | 265 | - | - | - | - | - | - | - | - |
| | | | 10.5 | 28 | 06.2 | 96 | 01.7 | 156 | | | | | | |
| -65° | - | - | 13.5 | 332 | 17.8 | 264 | 22.3 | 204 | - | - | - | - | - | - |
| | | | 09.6 | 51 | 06.3 | 97 | 02.8 | 141 | | | | | | |
| -60° | - | - | 14.4 | 309 | 17.7 | 263 | 21.2 | 219 | - | - | - | - | - | - |
| | | | 09.1 | 63 | 06.4 | 98 | 03.5 | 132 | | | | | | |
| -55° | - | - | 14.9 | 297 | 17.6 | 262 | 20.5 | 228 | - | - | - | - | - | - |
| | | | 08.9 | 71 | 06.5 | 99 | 04.0 | 127 | | | | | | |
| -50° | - | - | 15.1 | 289 | 17.5 | 261 | 20.0 | 233 | - | - | - | - | - | - |
| | 11.8 | 16 | 08.8 | 77 | 06.6 | 101 | 04.3 | 124 | 00.0 | 180 | | | | |
| -45° | 12.2 | 344 | 15.2 | 283 | 17.4 | 259 | 19.7 | 236 | 24.0 | 180 | - | - | - | - |
| | 10.9 | 46 | 08.7 | 83 | 06.7 | 102 | 04.7 | 121 | 01.7 | 155 | | | | |
| -40° | 13.1 | 314 | 15.3 | 277 | 17.3 | 258 | 19.3 | 239 | 22.3 | 205 | - | - | - | - |
| | 10.5 | 64 | 08.7 | 88 | 06.8 | 103 | 04.9 | 119 | 02.4 | 145 | | | | |
| -35° | 13.5 | 296 | 15.3 | 272 | 17.2 | 257 | 19.1 | 241 | 21.6 | 215 | - | - | - | - |
| | 10.4 | 78 | 08.7 | 93 | 06.9 | 105 | 05.1 | 117 | 02.9 | 137 | | | | |
| -30° | 13.6 | 282 | 15.3 | 267 | 17.1 | 255 | 18.9 | 243 | 21.1 | 223 | - | - | - | - |
| | 10.3 | 90 | 08.7 | 98 | 07.0 | 106 | 05.3 | 116 | 03.3 | 132 | | | | |
| -25° | 13.7 | 270 | 15.3 | 262 | 17.0 | 254 | 18.7 | 244 | 20.7 | 228 | - | - | - | - |
| | 10.4 | 103 | 08.8 | 103 | 07.1 | 108 | 05.4 | 115 | 03.6 | 127 | 00.8 | 164 | | |
| -20° | 13.6 | 257 | 15.2 | 257 | 16.9 | 252 | 18.6 | 245 | 20.4 | 233 | 23.2 | 196 | - | - |
| | 10.5 | 115 | 08.9 | 108 | 07.2 | 109 | 05.6 | 114 | 03.8 | 123 | 01.6 | 148 | | |
| -15° | 13.5 | 245 | 15.1 | 252 | 16.8 | 251 | 18.4 | 246 | 20.2 | 237 | 22.4 | 212 | - | - |
| | 10.7 | 128 | 09.0 | 112 | 07.4 | 111 | 05.7 | 114 | 04.1 | 120 | 02.1 | 138 | | |
| -10° | 13.3 | 232 | 15.0 | 248 | 16.6 | 249 | 18.3 | 246 | 19.9 | 240 | 21.9 | 222 | - | - |
| | 11.1 | 146 | 09.2 | 117 | 07.5 | 113 | 05.9 | 113 | 04.2 | 117 | 02.4 | 130 | | |
| - 5° | 12.9 | 214 | 14.8 | 243 | 16.5 | 247 | 18.1 | 247 | 19.8 | 243 | 21.6 | 230 | - | - |
| | 12.0 | 180 | 09.4 | 123 | 07.7 | 115 | 06.0 | 113 | 04.4 | 115 | 02.6 | 123 | 00.0 | 180 |
| 0° | 12.0 | 180 | 14.6 | 237 | 16.3 | 245 | 18.0 | 247 | 19.6 | 245 | 21.4 | 237 | 24.0 | 180 |

t = apparent solar time at the transmitting station.

a = azimuth of subsolar point from the transmitting station.

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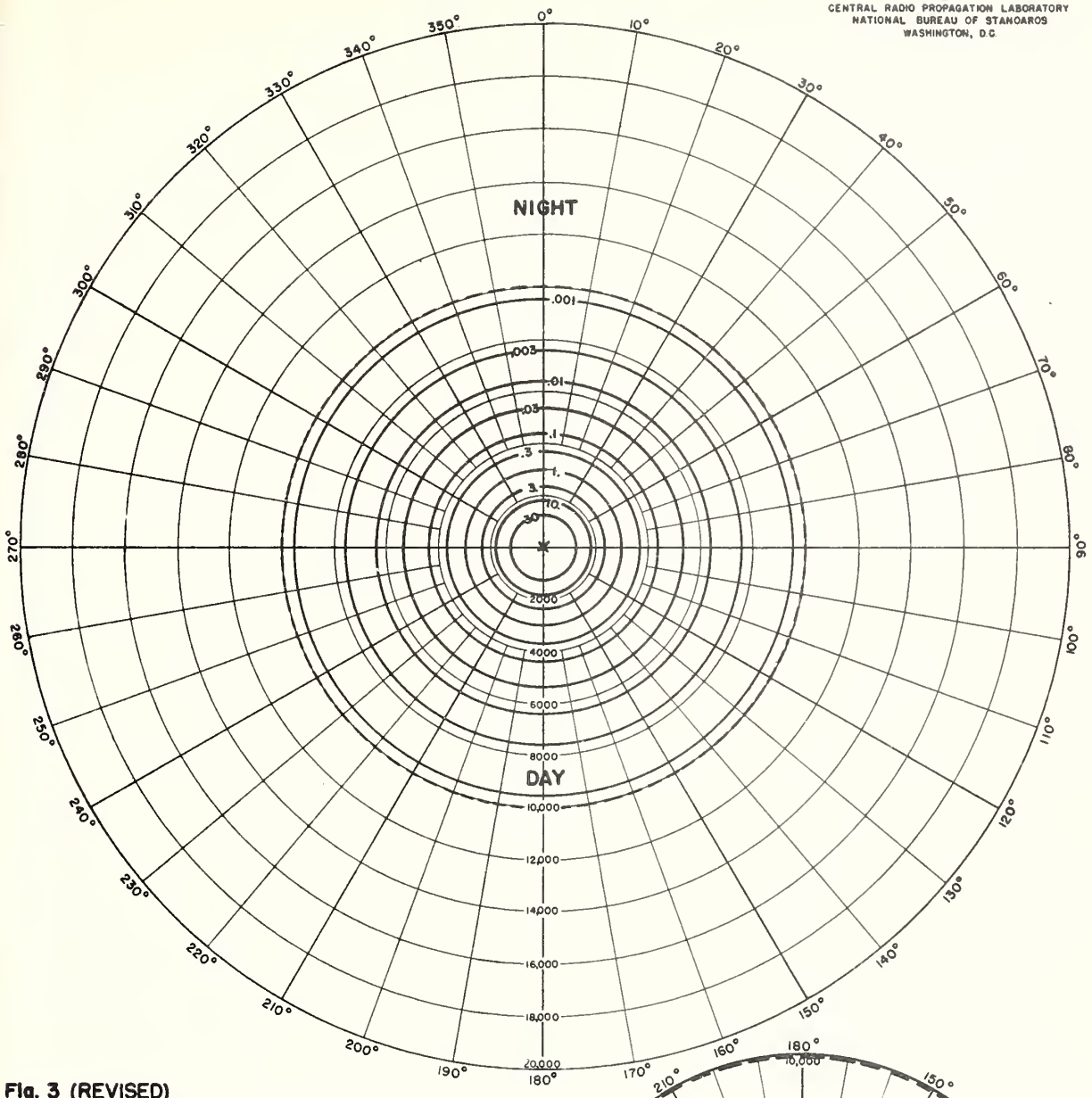
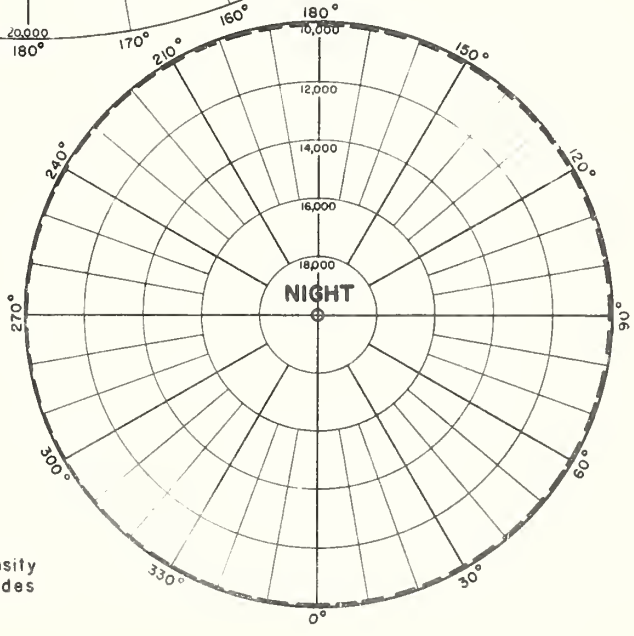



**Fig. 3 (REVISED)**
**FIELD INTENSITY, μV/m, 1 KW, 7 Mc**
**SUBSOLAR DISTANCE, 0 km (0°)**
**SUNSPOT MINIMUM**

⁂ SUBSOLAR POINT

⊙ POINT OF MINIMUM FIELD INTENSITY




Field Intensity
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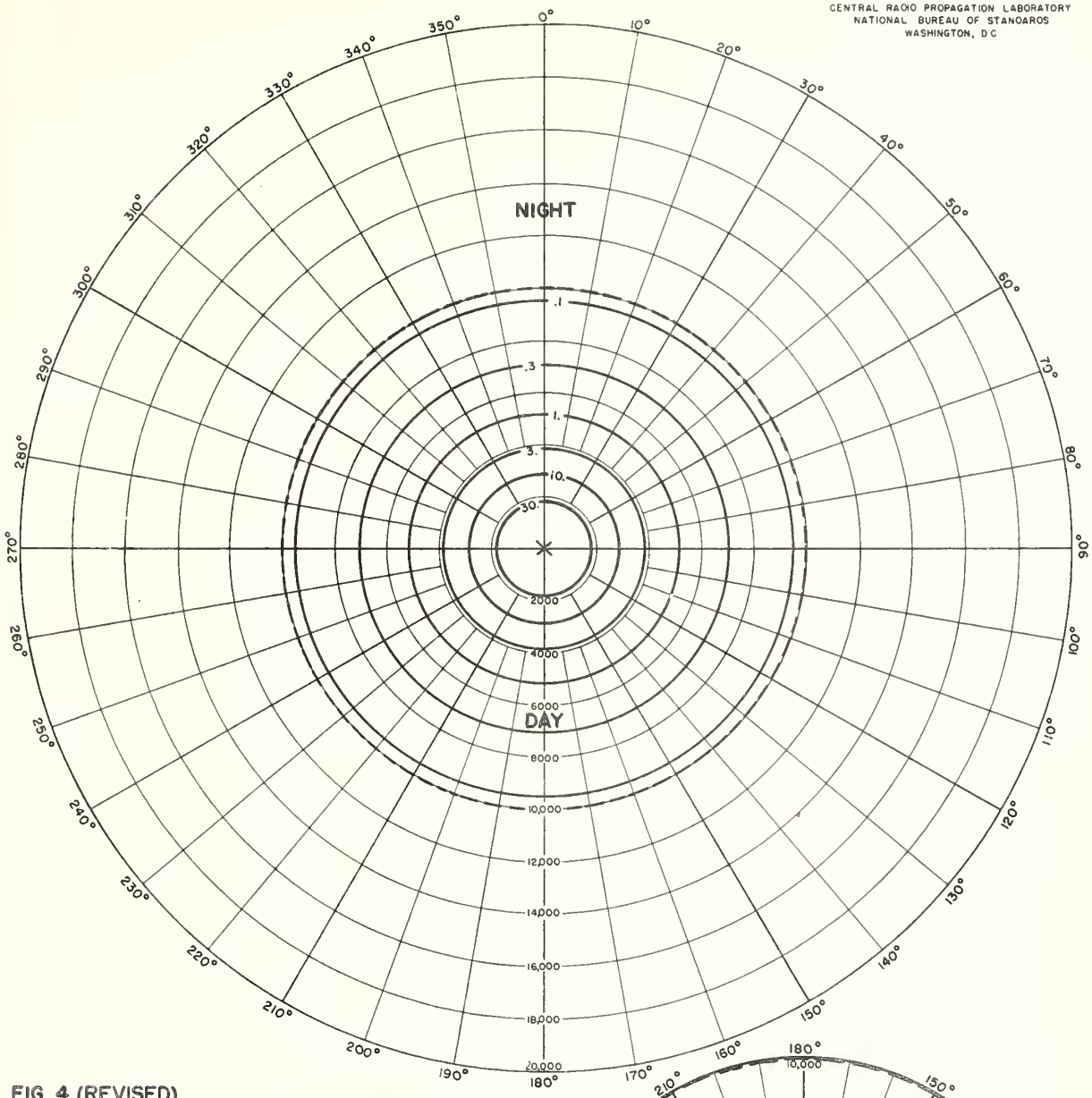
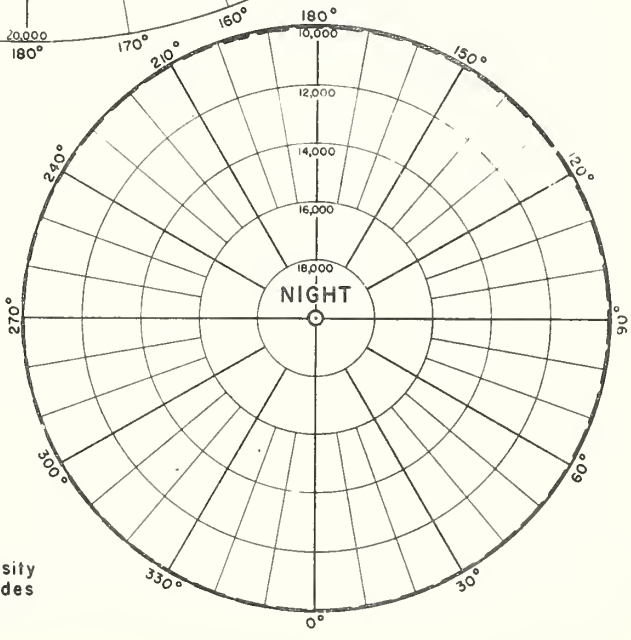



FIG. 4 (REVISED)
FIELD INTENSITY, μV/m, 1 KW, 10 Mc
SUBSOLAR DISTANCE, 0 km (0°)
SUNSPOT MINIMUM

✱ SUBSOLAR POINT
⊙ POINT OF MINIMUM FIELD INTENSITY

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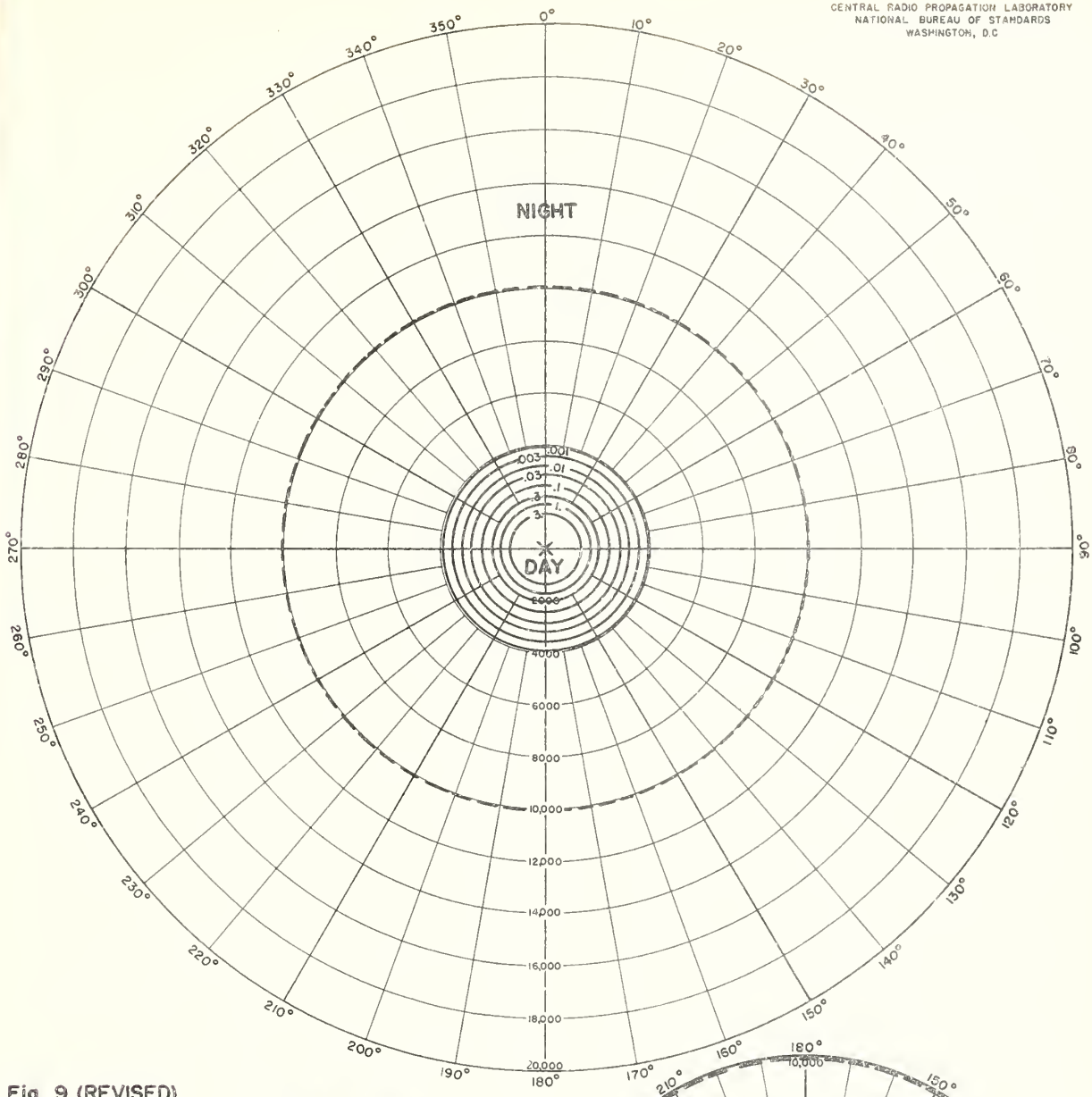
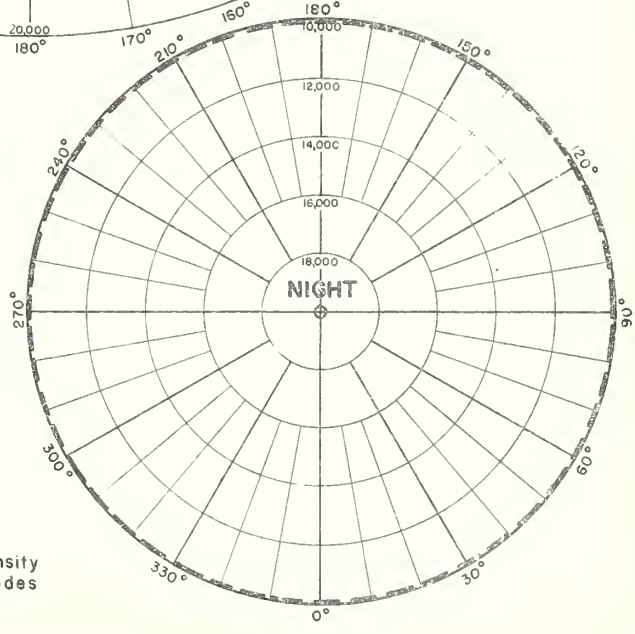



Fig. 9 (REVISED)
FIELD INTENSITY, μV/m, 1 KW, 7 Mc
SUBSOLAR DISTANCE, 0 km (0°)
SUNSPOT MAXIMUM

✳ SUBSOLAR POINT
⊙ POINT OF MINIMUM FIELD INTENSITY

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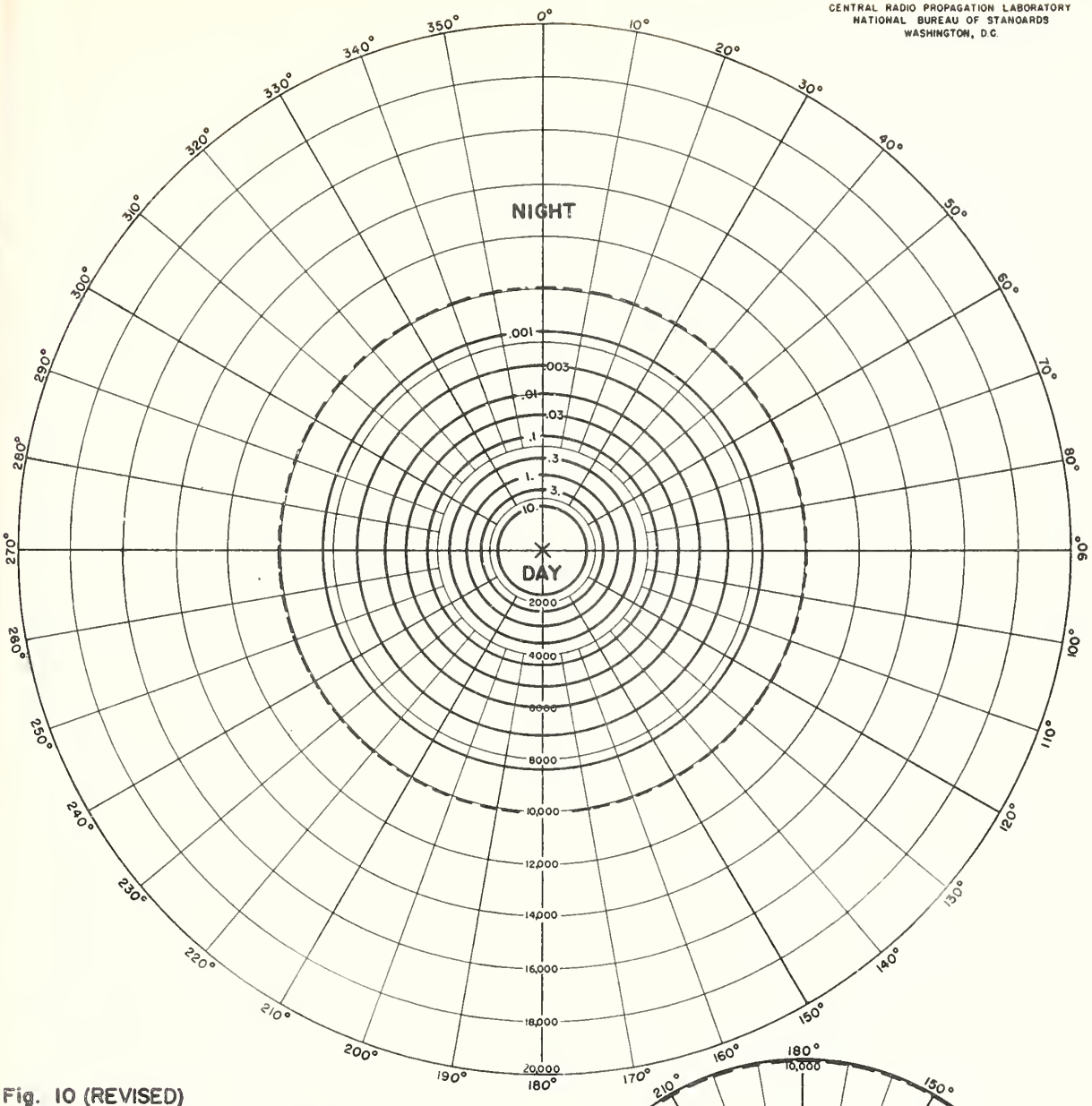
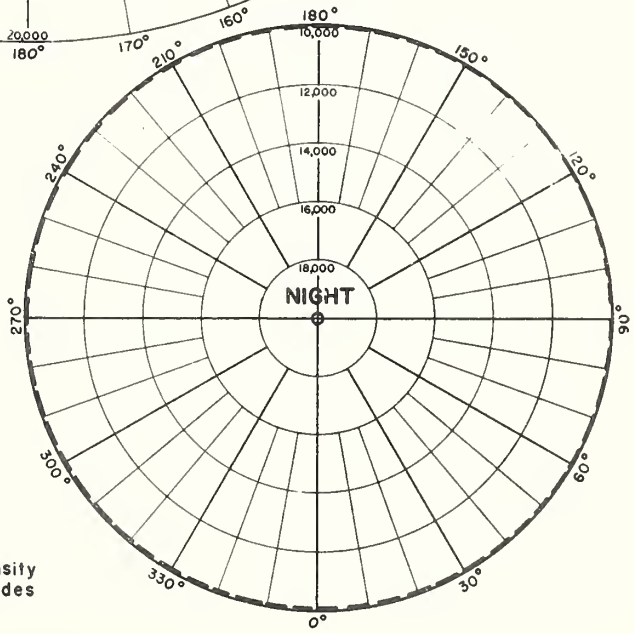



Fig. 10 (REVISED)
FIELD INTENSITY, μV/m, 1 KW, 10 Mc
SUBSOLAR DISTANCE, 0 km (0°)
SUNSPOT MAXIMUM

✳ SUBSOLAR POINT
⊙ POINT OF MINIMUM FIELD INTENSITY

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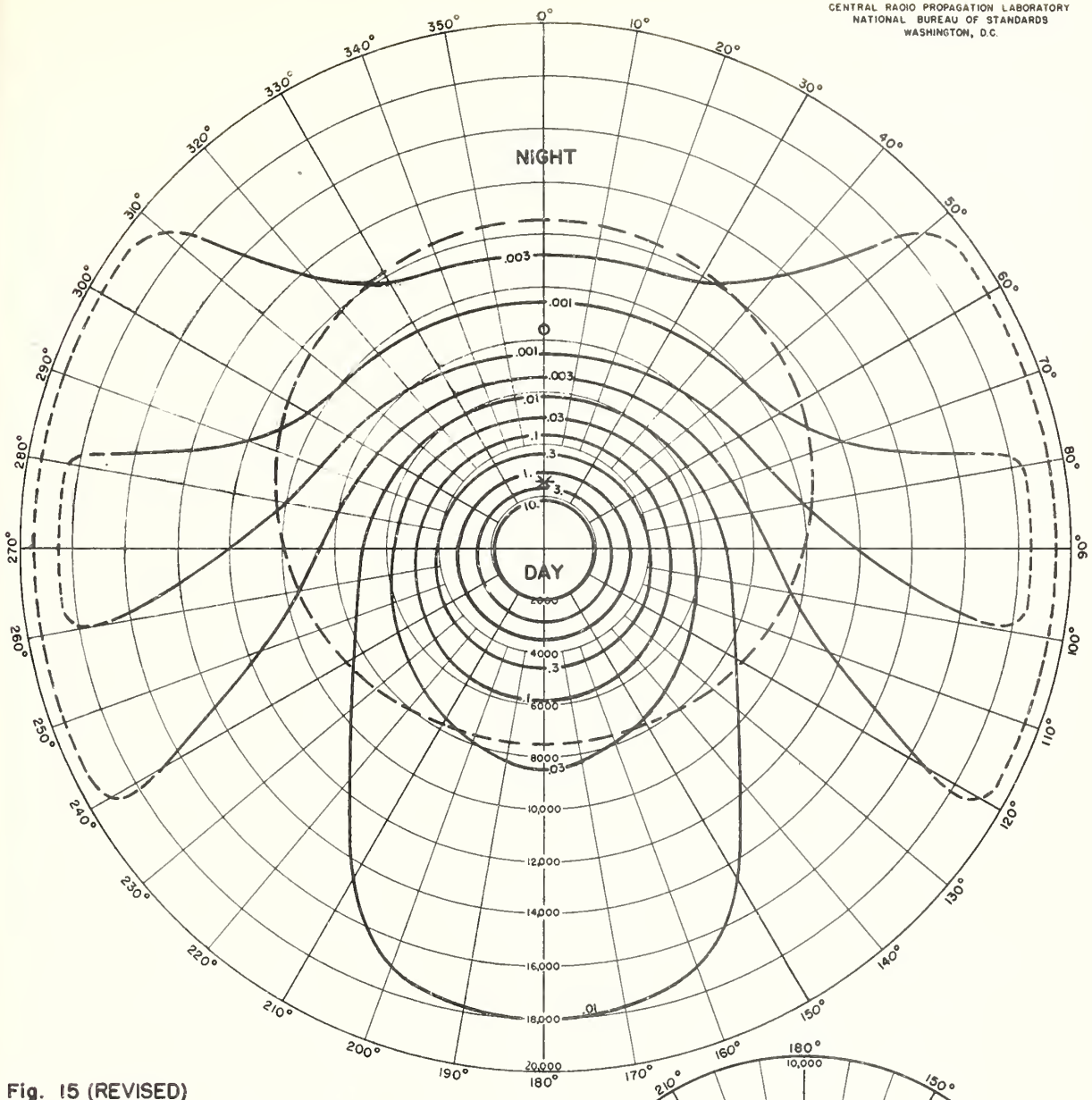
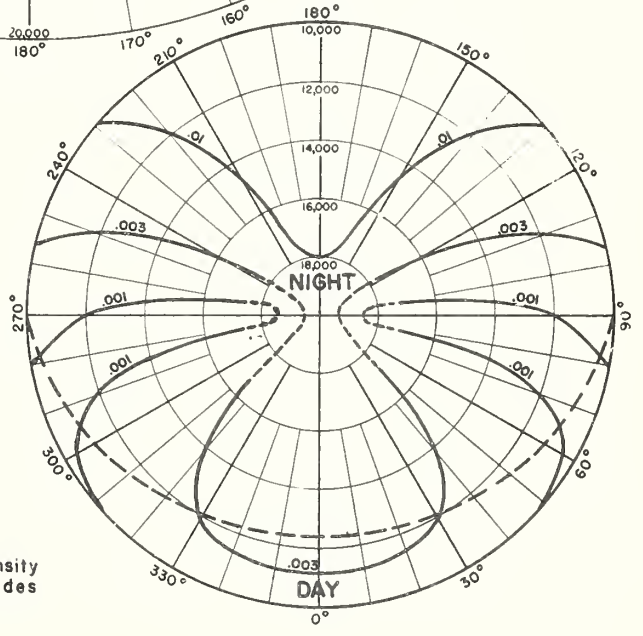



Fig. 15 (REVISED)
FIELD INTENSITY, μV/m, 1 KW, 7 Mc
SUBSOLAR DISTANCE, 2500 km (22° 30')
SUNSPOT MINIMUM

✳ SUBSOLAR POINT
⊙ POINT OF MINIMUM FIELD INTENSITY

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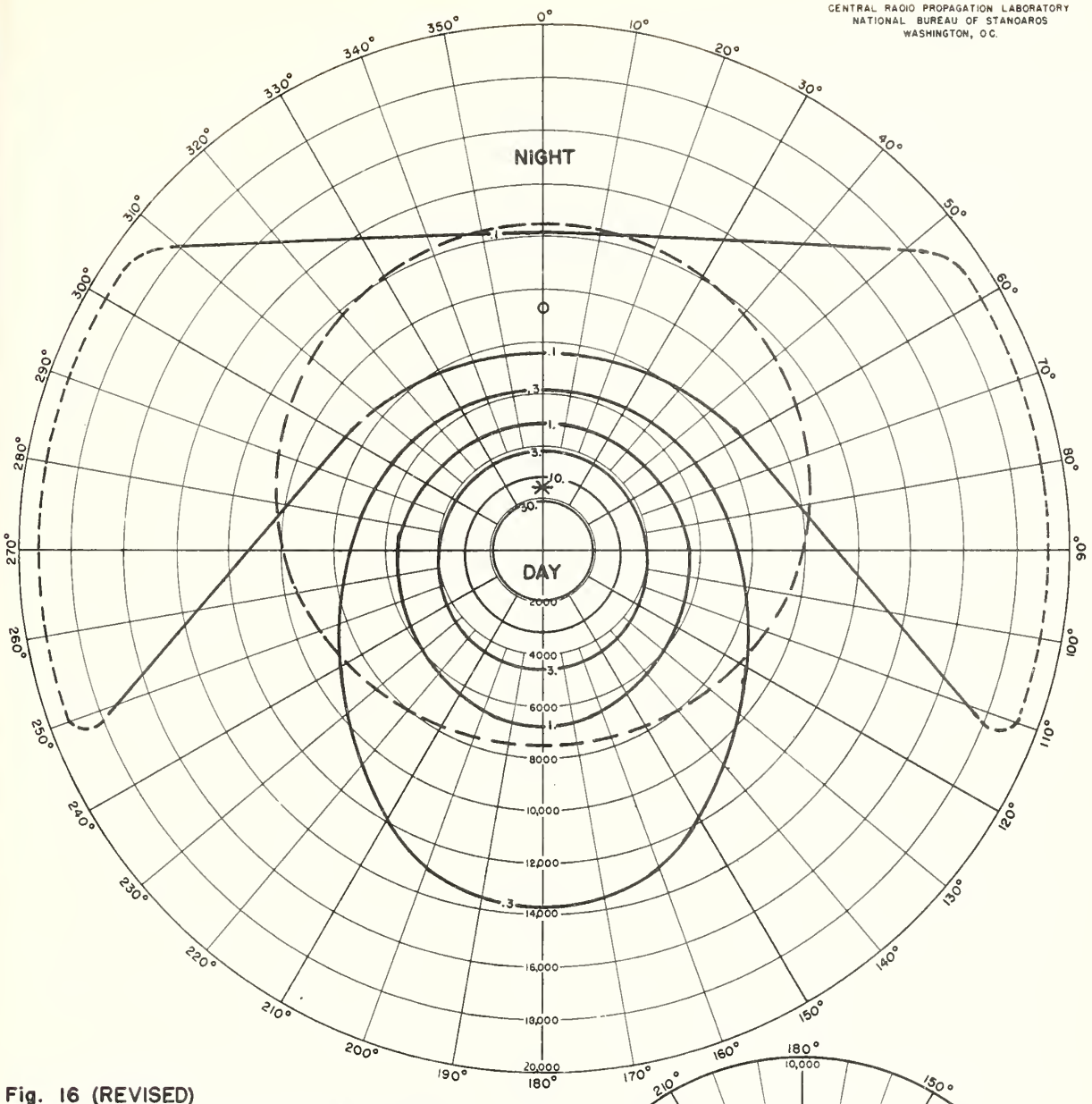
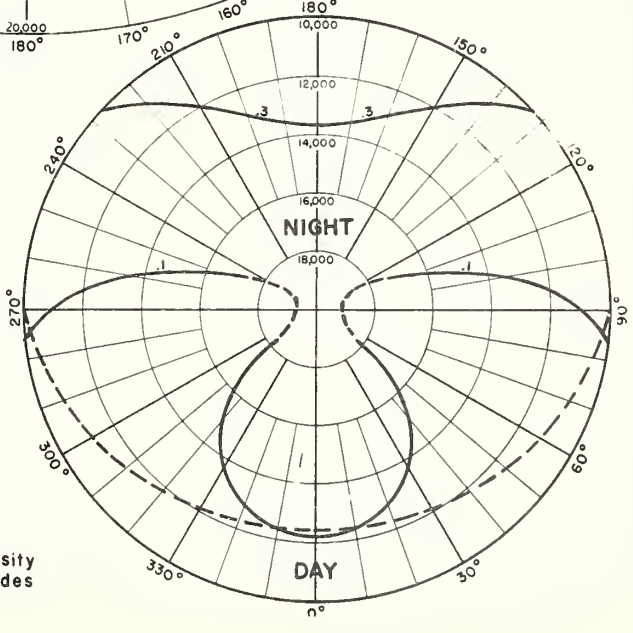



Fig. 16 (REVISED)
FIELD INTENSITY, μV/m, 1 KW, 10 Mc
SUBSOLAR DISTANCE, 2500 km (22° 30')
SUNSPOT MINIMUM

✱ SUBSOLAR POINT
⊙ POINT OF MINIMUM FIELD INTENSITY

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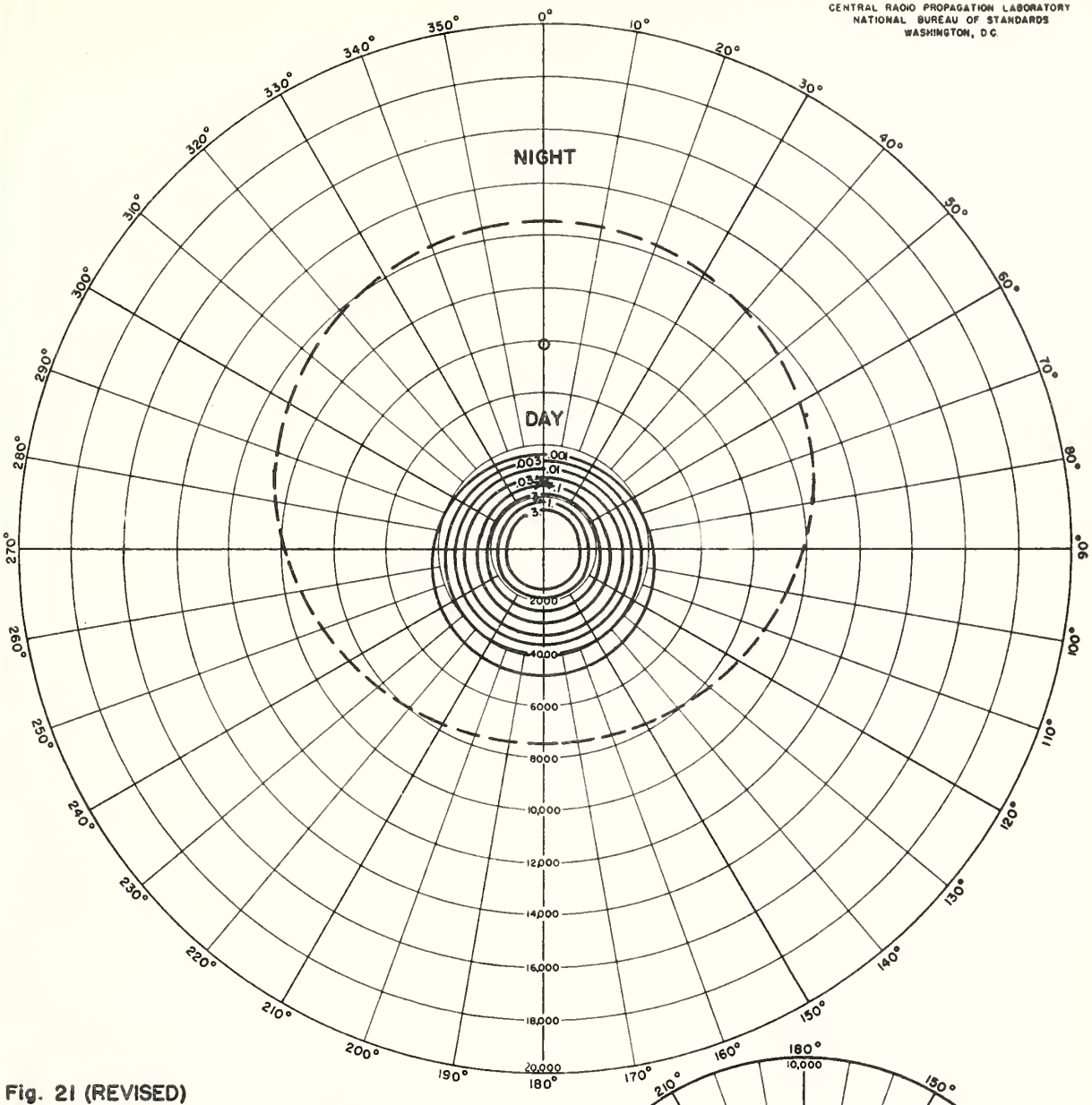
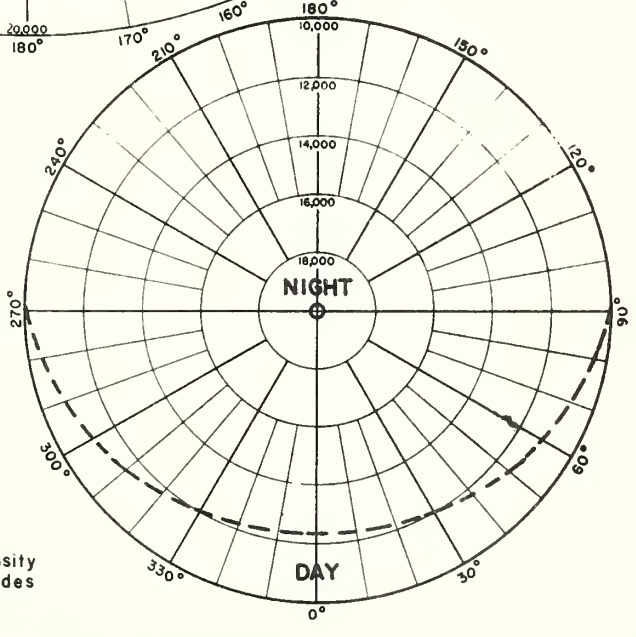



Fig. 21 (REVISED)
FIELD INTENSITY, μV/m, 1 KW, 7 Mc
SUBSOLAR DISTANCE, 2500 km (22°30')
SUNSPOT MAXIMUM

* SUBSOLAR POINT
⊙ POINT OF MINIMUM FIELD INTENSITY




Field Intensity
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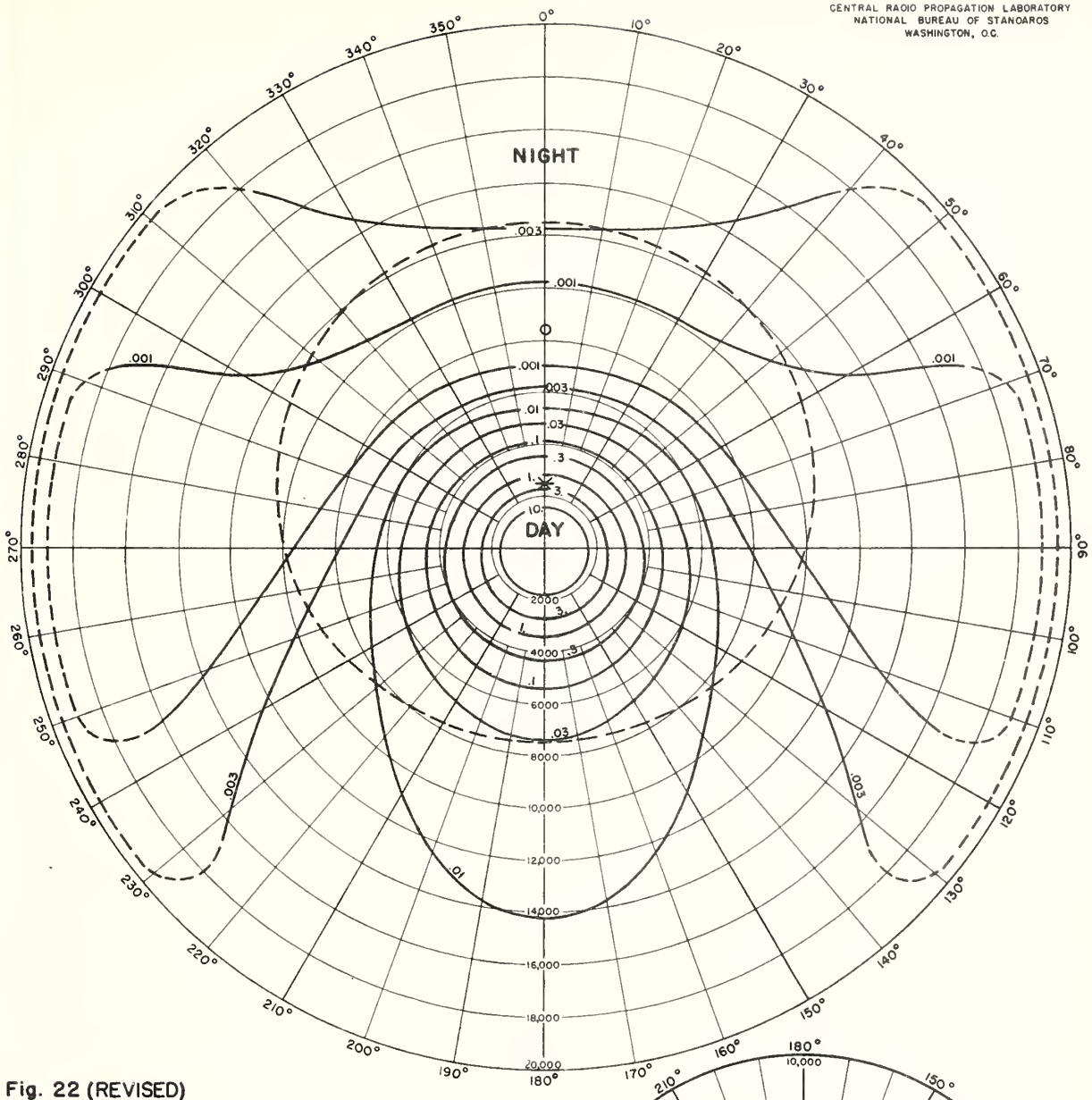
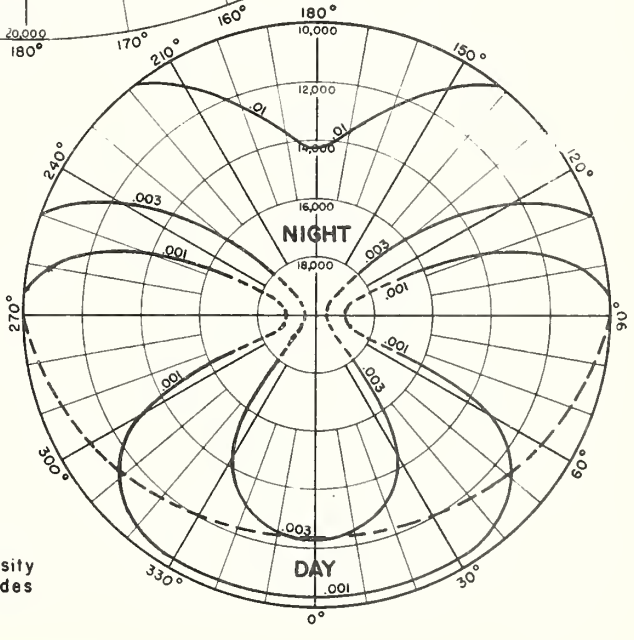



Fig. 22 (REVISED)
FIELD INTENSITY, μV/m, 1 KW, 10 Mc
SUBSOLAR DISTANCE, 2500 km (22°30')
SUNSPOT MAXIMUM

* SUBSOLAR POINT
0 POINT OF MINIMUM FIELD INTENSITY




Field Intensity
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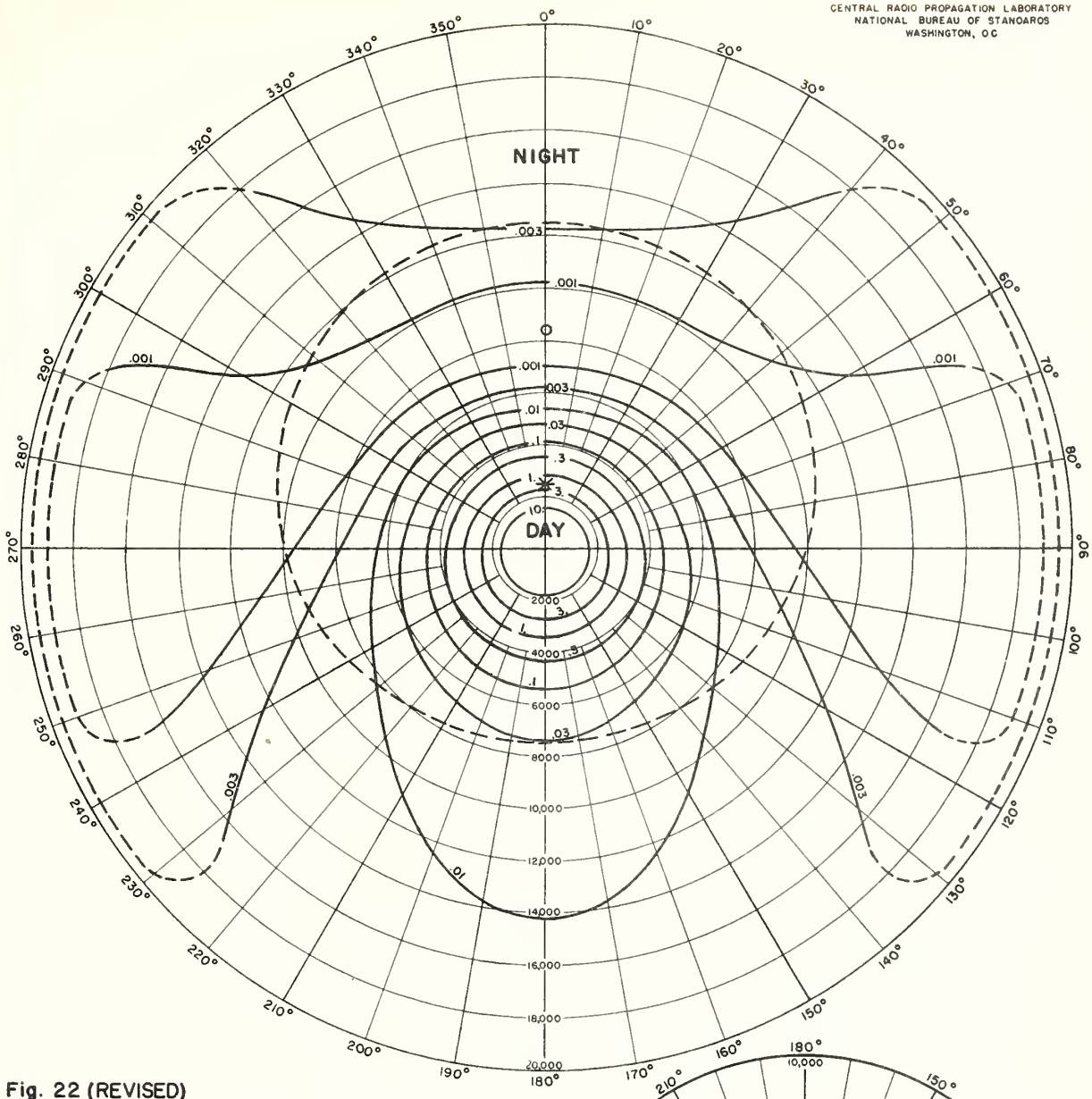
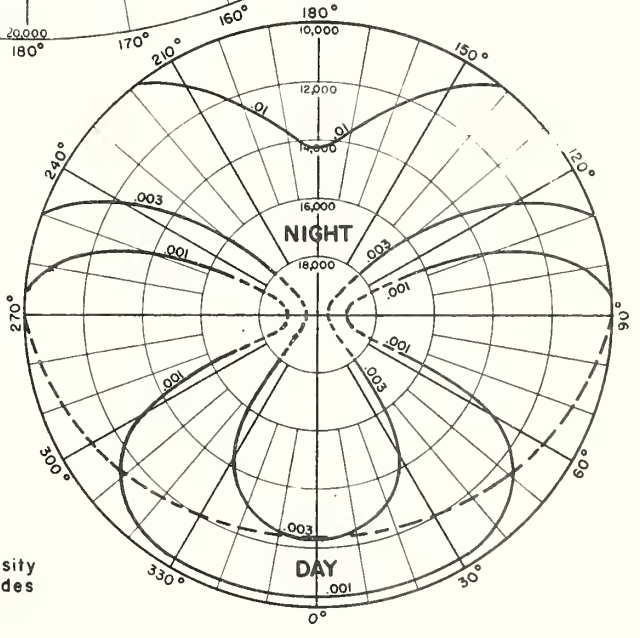



Fig. 22 (REVISED)
FIELD INTENSITY, μV/m, 1 KW, 10 Mc
SUBSOLAR DISTANCE, 2500 km (22°30')
SUNSPOT MAXIMUM

✱ SUBSOLAR POINT
⊙ POINT OF MINIMUM FIELD INTENSITY




Field Intensity
At Antipodes